

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

**CONSTRUCTION SPECIFICATIONS
AND DRAWINGS**



Relocation of ILS Localizers serving Runway
16C/16L and 16C ALSF Light Bar at the
Seattle-Tacoma International Airport and
Runway 16 at the Bellingham International
Airport
In
Seattle, Washington and Bellingham,
Washington.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

March 12, 2012

Prepared by:
FEDERAL AVIATION ADMINISTRATION
AIR TRAFFIC ORGANIZATION
TECHNICAL OPERATIONS UNIT
WESTERN SERVICE AREA
ENGINEERING SERVICES
NAVAIDS ENGINEERING CENTER - SEATTLE

TABLE OF CONTENTS

DIVISION 1 - GENERAL REQUIREMENTS

- 1010 SUMMARY OF WORK
- 1011 Seattle-Tacoma International Airport (SEA) Specifications

DIVISION 2 - SITE WORK

- 02100 SITE PREPARATION
- 2200 EARTHWORK
- 2201 GEOWEB
- 2505 GRANULAR PAVING
- 2506 SEEDING

DIVISION 3 - CONCRETE

- 03100 CONCRETE FORMWORK
- 03200 CONCRETE REINFORCEMENT
- 3300 CAST-IN-PLACE CONCRETE

DIVISION 16000 ELECTRICAL

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

16100 ELECTRICAL INSTALLATION
16950 ELECTRICAL TESTING

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

TABLE OF CONTENTS

GENERAL

- 1.1 SCOPE OF WORK
 - 1.1.1 Construction of the SEA 16C AND 16L Localizer.
 - 1.1.2 Construction of the SEA 16C ALSF Light Bar
 - 1.1.3 Construction of the BLI 16 Localizer.
- 1.2 REFERENCES
- 1.3 DRAWINGS
 - 1.3.1 Construction Drawings Provided
 - 1.3.2 As-Built Drawings
- 1.4 SUBMITTALS
 - 1.4.1 Material
 - 1.4.2 Schedule
 - 1.4.3 Schedule of Values
 - 1.4.4 Safety Plan
 - 1.4.5 Work Plan
 - 1.4.5.1 Work Scheduling
 - 1.4.6 Testing

PRODUCTS

- 2.1 GOVERNMENT FURNISHED MATERIAL
 - 2.1.1 Inventory and Inspection of GFM
- 2.2 CONTRACTOR FURNISHED MATERIAL

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

EXECUTION

3.1 SCHEDULES

3.1.1 Work Schedule

3.1.2 Construction Schedule

3.1.3 Weekly Look Ahead Work Schedule

3.1.4 Deviation from Work Schedule

3.1.5 Daily Construction Log

3.2 PRE-CONSTRUCTION MEETING

3.3 LAYOUT

3.4 SPECIAL REQUIREMENTS

3.4.1 Special Precautions

3.4.2 Safety Requirements

3.4.2.1 Runway Safety and Object Free Areas

3.4.2.2 Approach Surface

3.4.2.3 Construction Vehicle Traffic

3.4.2.4 Unauthorized Structures

3.4.2.5 Hazard Marking

3.4.2.6 Safety Plan

3.4.3 Radio Communications

3.4.4 Work Limitations

3.4.5 Work Plan

3.5 PROTECTION OF EXISTING UTILITIES AND CABLES

3.6 INSTALLATION AND WORKMANSHIP

3.7 TEMPORARY FACILITIES

3.7.1 Temporary Water

3.7.2 Temporary Toilets and Sanitation

3.8 SECURITY REQUIREMENTS

3.9 SAFETY

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 3.10 SEDIMENTATION, EROSION, AND DUST CONTROL
- 3.11 DEBRIS CONTROL AND CLEAN-UP
- 3.12 INSPECTION & ACCEPTANCE

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 SCOPE OF WORK

The work covered under this specification includes the relocation of the existing Instrument Landing System (ILS) localizer systems at the Seattle International Airport (SEA) runways 16C and 16L. As a part of this work is the SEA 16C ALSF light station 10+00 relocation.

This work also covers the relocation of the existing Instrument Landing System (ILS) localizer system at the Bellingham International Airport (BLI) runway 16.

More specifically the ILS localizer work shall be comprised of:

- Relocation of the existing Localizer system serving SEA runway 16L. This work shall be comprised but not limited to:
 - Construction of the new metal localizer platform and associated structures.
 - Relocation of the existing SEA 34R MALSR light station 10 onto the new platform.
 - New MG-20 installation for MALSR station 10.
 - Rewiring of the existing SEA 34R MALSR light station 10.
 - New duct banks and handholes (HH).
 - Installation of all coax and telco cables into the duct bank system.
 - Refurbishment of existing access roads.
 - Sealing of the existing incoming power cables at the shelter power transformer.
 - Demolition of the existing SEA 16L localizer antenna foundation and associated duct banks and cables.
- Relocation of the existing Localizer system serving runway the SEA 16C. This work shall be comprised but not limited to:
 - Construction of the new metal localizer platform and associated structures.
 - Construction of a new localizer shelter plot plan including new shelter foundations, gravel areas, asphalt and retaining wall.
 - Construction and duct bank tie into the relocated DME antenna.
 - New duct banks and handholes (HH) including a duct bank tie into the existing FOTs system and existing engine generator.
 - New power racks including power panel, TVSS, safety switches and disconnect switches.
 - Installation of all coax, power and telco cables into the duct bank system.
 - Connection of the power and telco system into the shelter.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- Construct new access road.
- Demolition of the existing SEA 16L localizer antenna foundation and associated duct banks and cables.
- Demolition of the existing localizer plot which includes relocation of the existing SEA engine generator shelter to the SEA SSC TRACON storage area, demolition and disposal of the existing SEA localizer shelter and misc. plot structures.
- Relocation of the SEA 16c ALSF light bar 10+00. This work will require the existing light bar be reconfigured in place. Work includes structural steel, resetting the existing MG-40 light bars, new power conductors, and new maintenance stands.
- Relocation of the existing Localizer system serving runway the BLI runway 16. This work shall be comprised but not limited to:
 - Construction of the new metal localizer platform and associated structures.
 - Construction of a new localizer shelter plot plan including new shelter foundations, and gravel areas.
 - New duct banks for connecting the new Localizer platform to the new shelter. Duct banks for bringing commercial power and telco to the new shelter plot.
 - Installation of all coax, power and telco cables into the shelter. This includes the commercial power and telco along with connections between the shelter and new localizer platform.
 - New power racks including power panel, TVSS, safety switches and disconnect switches.
 - Construction of new access road and refurbishment of the existing access road.
 - Demolition of the existing localizer antenna foundations, shelter plot foundation and associated structures including all duct banks and cables.

The contractor is required to furnish all labor, materials (except Government furnished), services, equipment, insurance, bonds, security notifications, licenses, permits, and fees in accordance with applicable federal, state and local regulatory requirements to complete the specified work. Any miscellaneous labor, equipment and/or materials not specifically detailed or specified, but required to complete the project, shall be provided as an integral part of the work.

The dimensions, measurements, and quantity of materials listed in this specification and on the construction drawings are estimated and are presented to give the contractor an idea of the total scope of work. The contractor is strongly encouraged to make a site visit to verify the existing conditions, quantities of materials, and amount of work required. The contractor is responsible for assuring that the bid reflects all work required to accomplish this project. Coordinate site visit with the FAA Project Engineer, Dave Yee PE 425-227-2985.

1.1.1 Construction of the SEA 16C and 16L Localizer.

The Contractor shall comply with the following time frames for SEA 16L-34R and SEA 16C Localizer:

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

SEA 16L Localizer.

Construction of the SEA 16L localizer must occur first. Vehicle access to SEA 16L is through the Runway Safety Area (RSA) and is heavily controlled. All work inside the RSA that compromises the integrity of the RSA (excavation, vehicle/heavy equipment presence must occur between May 15th and June 20th only. Any vehicle access or excavation activity after June 20, will be heavily controlled and at times no access via the existing gravel road will be allowed.

The plans call for construction of wooden stairs that will allow contractor personnel foot access to the work site during the project.

Note: The following time frames must be adhered to:

SEA 16L-34R. Construction can occur on site and in the SEA 34R RSA between May 15 and June 20th. After June 20th, all work inside the RSA must be completed with one exception. On or about August 8th, the FAA will relocate the existing localizer antennas onto the new localizer platform. When this happens the contractor will be allowed back into the RSA to demolish and restore the site completely.

Work after August 8th for localizer pad demolition will occur from the hours of 0100 to 0530. The RSA must be restored and acceptable for airport operations by 0530. SEA airport operations will inspect the site at 0530 and will determine if the RSA is restored enough for AOA operations.

After the old localizer foundation is demolished and restored, no more work is allowed in the RSA. Work can continue on the platform and re-establishment of the MALSR light bar, as the platform is outside the RSA.

SEA 16C Localizer.

SEA 16C-34C. This work is divided into two options.

Option 1. This option calls for construction of the new localizer platform, gravel access road, asphalt surfaces, hand rail, duct bank from the new localizer platform back to the existing power and comm. HHs currently serving the existing SEA 16C localizer.

Note: This localizer platform and hand rail can be constructed at anytime since it is all outside of the RSA.

Note: The access road, duct bank, inside the RSA, shall be constructed only between July 20 and August 8th. This is the window of opportunity for performing working within the SEA 34C RSA.

Option 2. This option calls for construction of the new localizer platform, gravel access road,

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

asphalt surfaces, hand rail, construction of the new localizer shelter plot south of the proposed localizer, new duct banks, DME foundation and mast, hand rails, and power and fiber optics tie ins to existing HHs.

Note: This localizer platform, localizer plot, all duct banks outside the RSA, power tie in to the existing FAA transformer, power rack and hand rail can be constructed at anytime since it is all outside of the RSA.

Note: The access road and duct bank (inside the RSA) tie into existing HHs shall only be constructed between July 20 and August 8th. This is the window of opportunity for performing any work within the RSA.

1.1.2 Relocation of the SEA 16C ALSF Light Bar. This work must be completed between 7/20 and 8/8/12.

1.1.3 Construction of the BLI 16 Localizer.

The contractor shall relocate the BLI localizer system.

Note: Work at BLI must begin in July, 2012 and be completed within 60 days. Localizer relocation and old localizer demolition will occur in September, 2012.

1.2 REFERENCES

Airport Ground Vehicle Operations Guide

available from: www.faa.gov/runwaysafety/asw/downloads/AGVO-guide.doc

1.3 DRAWINGS

Callouts on the construction drawings indicate work to be done under this contract unless specifically noted "installed by others" or "existing". Callouts indicating work to be done do not always include the word "install".

1.3.1 Construction Drawings Provided

Drawings applicable to this project are listed in each drawing set. The written scale (e.g. 1"=100') is only valid for FAA "D - size" drawings (22"x34") and may be slightly off due to variations in printing. On reduced size drawings, the bar scales (where shown) and written dimensions remain valid.

1.3.2 As-Built Drawings

The contractor shall provide three complete sets of As-Built drawings to the FAA Project Engineer at the end of the project. The following color codes shall be used:

Red - to indicated new or changed information

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Green -to indicated deletions

Blue - to indicate notes to the draftsman

Any additional diagrams and/or schematics that would be helpful for the maintenance of the facility should also be included.

1.4 SUBMITTALS

1.4.1 Material

The contractor shall submit for approval; catalog data, cut-sheets, samples, and any other relevant information on the contractor furnished material to be used on this project. Two copies of the submittal package shall be given to the FAA Project Engineer for approval. Submittals on materials shall include, but is not limited to:

- Conduits PVC and RGC
- Concrete material
- Asphalt
- Crushed rock
- Reinforcement steel
- Geotextile fabric and GeoWeb materials
- Aggregate material.
- Seed, Mulch, Fertilizer and Tacifier
- Hand holes and lids
- McNichols Floor grating
- Misc. hardware.
- Electrical fittings and components.
- Labels.
- Noalox®.
- Additional items deemed necessary by the Project Engineer.

1.4.2 Schedule

Prior to start, the contractor shall submit a schedule and work plan to the Project Engineer for approval. See section 3.1.2 for the date to complete this project. The schedule shall show start dates, duration, and finish dates for each work activity. Activities shall include for each CLIN, but are not limited to:

- Site layout.
- Installation of foundations.
- Installation of any associated duct banks.
- Site work.
- Inspection and cleanup.

The FAA reserves the right to modify the contractor's sequence of activities in the interest of facility operation, airport runway extension work and airport safety.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1.4.3 Schedule of Values:

As described in the CLINs. Below are some of the major work items associated with this solicitation.

- Construction of the SEA 16L Localizer project.
- Construction of the SEA 16C Localizer project.
- Construction of the BLI 16 Localizer project.
- Construction of the SEA 16C ALSF Light Bar Station 10.

1.4.4 Safety Plan

The contractor shall submit a safety plan per paragraph 3.4.2.6 of this section.

1.4.5 Work Plan

The contractor shall submit a work plan per paragraph 3.4.5 of this section.

1.4.6 Testing

The contractor shall complete, at his own expense, all testing as required by these specifications. The results shall be submitted on approved FAA TRDR forms to the FAA Project Engineer. Required testing includes, but is not limited to, the following:

- Earth resistance test (see FAA-C-1217f, 5.3.6)
- All Required Concrete Testing (performed by an independent testing company).
- Soil Compaction Testing (performed by an independent testing company).

PART 2 PRODUCTS

Reference herein or in the construction drawings to any specific commercial product, process, or service, any trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the Federal Aviation Administration. The contractor may submit a request for substitution of a product, process, or service specifically called out. Such request shall be through the submittal process.

2.1 GOVERNMENT FURNISHED MATERIAL

- SEA 16C localizer shelter 12 by 30 feet long. The shelter will be delivered and set onto the contractor furnished foundation.
- BLI 16 localizer shelter 12 by 30 feet long. The shelter will be delivered and set onto the contractor furnished foundation.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- SEA 16L, SEA 16C and BLI 16 platform steel only. This includes the stairs accessing the platform.
- SEA 16C/16L and BLI steel platform.
- Three MG-20 stand assemblies with masts.

2.1.1 Inventory and Inspection of GFM

The government supplied shelters will be inspected by the government.

2.2 CONTRACTOR FURNISHED MATERIAL

The contractor shall furnish all material that is required and not otherwise indicated to be Government furnished. Materials furnished by the contractor shall be new, the standard products of manufacturers regularly engaged in the production of such materials, and of the manufacturer's latest designs that comply with the specification requirements.

The contractor is responsible for making their own arraignments for material delivery and receiving. The contractor shall not have any material delivered to any FAA offices. Delivery to the Airport address shall only be done with the prior approval of the airport management.

The list of contractor furnished material includes, but is not limited to:

- 4'x4' x4'deep H-20 and aircraft rated Pull Box's (hand holes), as required
- 6'X6'X4' deep aircraft rated and H-20 Pull Boxes (hand holes) as required.
- Concrete, re-bar, anchor bolts, cable markers, etc.
- Geotextile fabric, and GeoWeb materials as required.
- Power and comm. cables
- Aggregate material /asphalt/ crushed rock as required.
- PVC and RGC conduits as required.
- Heavy duty safety switches, power racks, disconnect switches.
- Earth Electrode Systems (EES)
- Electrical fittings and components, as required.
- Misc. hardware and Unistrut, as required.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- Labels for pull box's

PART 3 EXECUTION

3.1 SCHEDULES

3.1.1 Work schedule

All work shall be performed during the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. No work shall be performed outside these hours or scheduled on Saturdays, Sundays or legal holidays without prior approval from the FAA Project Engineer.

When work inside the RSA is required, the hours of work shall be between the hours of 0100 to 0600. All work must be completed each morning by 0530 to allow airport operations to inspect all clean up work prior to opening up the runway.

The contractor shall furnish the Resident Engineer with emergency (24 hour) contact phone numbers for the contractor's superintendent and an alternate individual. Such numbers will be used if the contractor needs to be contacted outside of normal working hours

3.1.2 Construction Schedule

Refer to section 1.1.1 to 1.1.3 for specific work time frames for each facility.

Prior to start, the contractor shall submit a schedule and work plan to the FAA Project Engineer for approval. See section 3.1.2 for the date to complete this project. The schedule shall show start dates, duration, and finish dates for each work activity. Activities shall include for each CLIN, but are not limited to:

- Site layout.
- Installation of foundations.
- Installation of any associated duct banks.
- Inspection and cleanup.

The FAA reserves the right to modify the contractor's sequence of activities in the interest of facility operation and airport safety.

3.1.3 Weekly Look Ahead Work Schedule

On a weekly basis, the contractor shall submit a schedule showing activities desired to be performed during the upcoming week. These work activities shall be approved by the FAA Project Engineer.

3.1.4 Deviation from Work Schedule

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

The Airport Manager and the FAA Project Engineer reserves the right to suspend or stop construction as necessary for the safety of aircraft or airport property. In addition, the FAA may adjust the work hours to satisfy the facility operations.

3.1.5 Daily Construction Log

The Contractor shall keep a Daily Construction Log. At a minimum, the daily log shall contain:

- Items accomplished for that day.
- Start and stop time of work.
- Name of workers (including sub-contractors), and hours they worked for that day.
- Weather (including sky, ground moisture conditions, and temperature).
- Material received.
- Documental photographs showing the progress of work, and as required.

The Daily Construction Logs shall be turned over to the FAA Project Engineer on a weekly basis.

3.2 PRE-CONSTRUCTION MEETING

Prior to the start of any work and the contractor's access to the work site, the contractor shall be required to attend a pre-construction meeting. Attendees at the meeting may include, but is not limited to, the FAA Project Engineer, Resident Engineer, FAA Contracting Officer, the Airport Manager, Airport Operations, FAA maintenance, and other interested parties as determined by the Project Engineer. Topics at the meeting will include; site access, airport security, work safety, work schedule, project expectations, work procedures, emergency plans, and other items relating to the execution of the project.

3.3 LAYOUT

The contractor shall verify the field measurements and coordinates indicated on the drawings with the FAA Project Engineer before starting any layout. The contractor shall lay out his work from base lines and bench marks indicated on the drawings and shall be responsible for all measurements in connection therewith. The contractor shall furnish, at his own expense, all stakes, templates, platforms, equipment, tools, materials and labor as may be required in laying out any part of the work. All layout work shall be accomplished by a Professional Land Surveyor. The contractor is to properly maintain the specified layouts to assure proper alignment of the construction. Roads indicated to be installed under this contract shall be laid out and clearly marked at the beginning of the project and used as access roads during construction so as to minimize the disturbance to the surrounding areas.

3.4 SPECIAL REQUIREMENTS

3.4.1 Special Precautions

If any proposed duct banks comes within 2 feet of a located existing underground power or telco. line, the contractor shall pot hole using a Vacuum Truck to expose the existing cables prior to beginning construction.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Note: Unscheduled interruptions of the electrical service to FAA facilities may cause aircraft accidents and loss of life. Work requiring a temporary or permanent de-energization of equipment shall be scheduled in writing with the FAA Project Engineer and the onsite FAA maintenance personnel. Only onsite FAA maintenance personnel are authorized to energize/de-energize equipment, or to operate a circuit breaker, switch, or fuse in an FAA facility.

3.4.2 Safety Requirements

Aviation Safety is a primary consideration during airport construction. The Contractor is completely responsible for complying with the Airport's safety and operation procedures, as dictated by the Airport if work within the AOA is required. No work is currently envisioned to be conducted within the AOA.

During the performance of this contract, the airport runways, taxiways, and aircraft parking aprons shall remain in use by aircraft to the maximum extent possible, **CONSISTENT WITH CONTINUAL SAFETY**. The contractor shall not allow employees, subcontractors, suppliers, or any other unauthorized person to enter or remain in any airport area which would be hazardous to persons or to aircraft operations.

Employees violating any active runway safety areas (incursions) will be permanently removed from the entire project.

3.4.2.1 Runway Safety and Object Free Areas

The Runway Safety Area (RSA) for runways 16-34 at the Seattle Tacoma International Airport is a rectangular area extending 250 ft on each side of the runway centerline and 1000 ft beyond the ends of the runway threshold.

Prior to commencement of work, the contractor shall delineate the boundaries of the safety area with 3/8" x 1 1/2" x 4' long pointed lath (survey sticks) and bright orange flagging.

The contractor shall not be allowed into the Runway Safety Area without prior approval from the FAA Project Engineer and the Airport Manager. In general, no workers or equipment shall be allowed inside the safety area when aircraft are using the runway. Work to be done inside the safety area shall be scheduled and closely coordinated with the FAA Project Engineer and the Airport manager.

The contractor shall not be allowed to place vehicles and/or equipment inside the Runway Object Free Area (OFA) without the approval of the FAA Project Engineer. The Runway Object Free Area (OFA) for the SEA and BLI International Airport is a rectangular area extending 400 ft on each side of the runway centerline and 1000 ft beyond the ends of the runway threshold.

In addition to the restrictions of working in the Runway Safety area and Object Free Area, the Airport Manager and/or the FAA Project Engineer may impose more restrictive requirements as needed to maintain airport safety.

3.4.2.2 Approach Surface

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

No vehicles or equipment shall be permitted to penetrate an approach surface (extended along the runway centerline) 50:1 for runways. The approach surface begins at the runway threshold centerline elevation and starts 200 ft downwind from the threshold (or from the location of the Displaced/Relocated threshold).

3.4.2.3 Construction Vehicle Traffic

The contractors' vehicles and equipment shall enter the work site and construction areas at approved locations, and by way of authorized routes. The use of runways, aprons, taxiways, ramps, will not be permitted unless specifically approved by the FAA Project Engineer and the Airport Manager. The contractor shall inform all personnel that aircraft have the right-of-way at all times. The contractor shall be responsible for maintaining control and security at each entry point, as approved.

As a minimum, all vehicles and motorized equipment that enter the Airport Operations Area (AOA) shall be marked per AC 150/5210-5B (or latest version). In general, all vehicles and motorized equipment inside the AOA shall be marked with a three foot by three foot flag with international orange and white 12 inch squares displayed in full view above the vehicles and with an approved yellow flashing beacon.

In addition, no personnel will be permitted to drive on the airside of the airport unless he/she has read, and certified that he/she has read, “ A Guide to Ground Vehicle Operations on an Airport” (DOT/FAA/AS-90-3). A copy of this document is attached at the end of this specification.

SEA AND BLI AND/OR THE FAA MAY HAVE ADDITIONAL REQUIREMENTS FOR VEHICLES, EQUIPMENT, AND PERSONNEL OPERATING INSIDE THE AOA.

3.4.2.4 Unauthorized Structures

The contractor shall install no fences or other physical obstructions on or around the project work area without the approval of FAA Project Engineer.

3.4.2.5 Hazard Marking

The contractor shall use barricades, flashers, flags, traffic cones, signs, etc., for the following:

- To outline construction/maintenance areas.
- To identify isolated hazard areas such as open manholes, ditches, potholes, waste areas, etc.
- To identify FAA and Airport facilities, cables, power lines, and other sensitive areas, in order to prevent damage, interference and facility shutdown.

All hazard markings shall be furnished and setup by the contractor. All markings shall be to the approval of the FAA Project Engineer.

3.4.2.6 Safety Plan

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Prior to commencement of work, the contractor shall submit a safety plan for approval by the Project Engineer and the airport. An acceptable safety plan shall take into account areas discussed in Appendix 1 of AC 150/5370-2C and the Airport's rules for construction activity at the Airport.

3.4.3 Radio Communications

The contractor's superintendent (or someone appointed by the superintendent) shall be required to monitor a transceiver radio at all times when the contractor is operating inside the runway safety area. The transceiver shall be contractor furnished with a frequency range of 118-136 Mhz and tuned to the local ATCT Tower or Ground Control (CTAF when tower is closed) frequency, UNICOM frequency, or as required. Such radios shall be used so that any unusual occurrence of approaching, departing, taxiing aircraft can be acknowledged by all concerned parties. The contractor's use of the transceiver radio is basically for listening purposes, transmitting should be in emergencies only.

3.4.4 Work Limitations

The contractor's activities shall be planned and scheduled to minimize disruption of normal aircraft activities. If the clearances and restrictions described in this section cannot be maintained while construction is underway (for example, when performing work that is required inside the runway safety area), action shall be taken to close runways (or taxiways, or aprons), displace/relocate the runway threshold temporarily (see 3.4.4.2), and/or to perform work at night or during periods of minimal aircraft activity, as approved.

3.4.5 Work Plan

Prior to commencement of work, the contractor shall submit a work plan for approval by the Project Engineer (see 1.4). An acceptable work plan shall take into account all areas discussed in this section.

3.5 PROTECTION OF EXISTING UTILITIES AND CABLES

The existing utility lines, utility structures and all underground cables, as may be shown on the drawings are approximate and incomplete. Where excavation occurs in the vicinity of existing utilities or cables, the contractor shall use a private professional cable locator (APS) or as approved by the FAA, to locate the existing utilities or cables prior to any excavation. The contractor shall stake all utility or cable crossings and such areas shall be vacuum truck excavated. The contractor shall immediately repair any damage done by the contractor or suppliers to utilities or cable within the work area.

If any proposed duct banks comes within 2 feet of a located existing underground power or comm. line, the contractor shall pot hole using a vacuum truck to expose the existing cables prior to beginning construction.

3.6 INSTALLATION AND WORKMANSHIP

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

All work shall be performed according to the intent of the contract, and normal and accepted industry and Government standards.

All work shall be accomplished by skilled workers regularly engaged in this type of work. Where required by local regulations, the workers shall be properly licensed.

The contractor shall give constant attention to the work to facilitate the progress thereof, and shall cooperate with the Project/Resident Engineer in every way possible. The contractor shall have a competent superintendent on the work site at all times who is fully capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the Project/Resident Engineer.

An initial inspection shall be conducted when a representative sample of work has been completed. This work shall be approved by the FAA Project Engineer or his representative, prior to the commencement of additional work.

All conduits shall be completely cleaned prior to installing cable. A flexible mandrel shall be used to clean out mud, dirt, and debris from the raceways.

Underground conduits shall be installed so that no water can be trapped in the raceway (water must be able to drain out of one end).

All foundations, manholes, vaults, pull boxes, equipment racks, buildings, roads, retaining walls and other above ground structures shall be installed square (perpendicular and parallel) to the runway centerline, prevailing structure or road as indicated on the drawings unless specifically indicated to be otherwise. Elevated conduits and structures (those extending above grade) shall be installed level and plumb. Unless otherwise indicated, maximum tolerance for vertical plumbness is $\frac{1}{8}$ " horizontal for every four feet vertical. Exposed raceways shall be installed parallel to or at right angles with the lines of the finished structure, unless otherwise indicated.

Tops of foundations, cans, pull boxes, manholes, vaults, etc., shall be uniform with the tops of concrete at the surrounding structures, natural grade or as indicated on the drawings or as directed by the Project Engineer. Unless otherwise indicated, top of foundations, cans, pull boxes, manholes, etc. shall be level with a maximum tolerance of $\frac{1}{16}$ " per foot.

Road curves shall be as indicated on the drawings or as indicated by the Project Engineer. Edges of roads, walkways and graveled areas shall be clean, sharp, and well defined. Installed surface material shall not be allowed to spill outside the defined edges.

Installed foundations, structures, walkways, and roads not meeting the above requirements shall be removed, disposed of, and re-installed correctly at the contractor's expense.

3.7 TEMPORARY FACILITIES

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

The contractor shall provide and pay for all temporary services and facilities as specified below and as necessary for the proper and expeditious execution of the work. The contractor shall make, or have made, all connections to existing services and sources of supply as necessary and/or indicated and pay all charges for same. All work under this Section shall comply with applicable laws, rules, regulations, codes, ordinances, and orders of all Federal, State, and Local authorities having jurisdiction for the safety of persons, materials and property. The contractor shall remove all such temporary installations and connections when no longer necessary for the project work.

3.7.1 Temporary Water

The contractor shall make arrangements to furnish a potable water supply for workers and project work, and pay for all water and services.

3.7.2 Temporary Toilets and Sanitation

The contractor shall provide ample and suitable on site sanitary conveniences with proper enclosures for the use by the workers, FAA personnel, and FAA support personnel. Such conveniences shall be kept clean, properly ventilated and installed and maintained in conformity with requirements of all laws and ordinances governing such installations. Locations shall be subject to the FAA Project Engineer's approval. After completion of the work such conveniences shall be removed from the site.

3.8 SECURITY REQUIREMENTS

The contractor shall comply with all security requirements established by the Airport. Only direct construction support personnel, vehicles and/or equipment will be allowed to the construction site. All other vehicles (including personal vehicles) will be parked outside the AOA or FAA construction site.

During construction operations, the contractor shall use haul roads that are designated by the FAA Project Engineer.

3.9 SAFETY

All work shall be accomplished in accordance with OSHA Regulations (Standards – 29 CFR), Part 1926, Safety and Health Regulations for Construction.

Protective Equipment, including personal protective equipment for eyes, face, head, and protective clothing shall be used wherever it is necessary by reasons of hazards or environment [1926.95].

- Head protective equipment (helmets) shall be worn in areas where there is a possible danger of head injuries from impact, flying or falling objects, or electrical shock and burns [1926.100].
- Eye and face protection equipment shall be worn when machines or operations present potential eye or face injury [1926.102].

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Specific work and operations requiring the mandatory use of personnel protective equipment shall be determined by the FAA Project Engineer.

3.10 SEDIMENTATION, EROSION, AND DUST CONTROL

The Contractor shall submit a airport approved TESC plan for sedimentation, erosion, and dust control. The plan shall show best management practices such as the use of silt fencing and/or hay bales to filter sediments from runoff and the application of water as needed to control dust.

If pumping of water is required in any excavations, then the contractor will notify the SEA or BLI Airport water specialist. The water will be analyzed and a mitigation for disposal of this water will be provided. Allow a min. of one days notice if pumping will be required. Disposal of water will range from disposal at the site to transport to a SEA or BLI approved disposal site within 5 miles of the construction site. The costs of transportation of this waste water from excavations is the responsibility of the contractor.

3.11 DEBRIS CONTROL AND CLEAN-UP

The work site shall be kept clean and orderly during the progress of work. Special attention shall be exercised to prevent the production of FOD (foreign object debris) which could cause damage to aircraft and/or airport equipment. Prior to the Contract Final Inspection, the contractor shall clean all areas of the construction site. This shall include but is not limited to the dress-up, sweep-up, and re-seeding of all areas disturbed during construction. A NEAT FINAL APPEARANCE OF THE INSTALLED FACILITIES (INTERIOR AND EXTERNAL) SHALL BE EMPHASIZED! All clean-up work shall be to the approval of the FAA Project Engineer.

Upon completion of work, the contractor shall be required to obtain a letter from the Airport Manager indicating that the work area has been left in an acceptable condition. A copy of the letter shall be given to the FAA Project Engineer.

3.12 INSPECTION & ACCEPTANCE

The Contractor shall maintain an adequate inspection system and perform such inspections to ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government.

THE PRESENCE OR ABSENCE OF A GOVERNMENT INSPECTOR DOES NOT RELIEVE THE CONTRACTOR FROM ANY CONTRACT REQUIREMENT.

The Government inspections and tests are for the sole benefit of the Government and do not-

- Relieve the Contractor of responsibility for providing adequate quality control measures;
- Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;
- Constitute or imply acceptance.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements. The Contractor shall promptly segregate and remove rejected material from the premises.

SECTION 1011

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

Section 01140 - Operational Safety On Airports During Construction

PART 1 GENERAL

1.01 SUMMARY

- A. The Sea-Tac International Airport is a complex operating facility which is governed by a very strict set of operating rules to insure the safety of the traveling public, the operators of the various airlines and those individuals who function as support personnel to the facility. It is recognized and understood that the Contractor is required to comply with the most current edition requirements contained in FAA Advisory Circulars and Port of Seattle Rules and Regulations as they pertain to this project. It is understood and accepted by the Port of Seattle that the Contractor has familiarized itself with general Airport operations and has taken these into consideration in arriving at its bid prices and in scheduling its various activities.
- B. Following are the general safety operations and objectives that must be achieved to maximize safety and to minimize time and economic loss to the aviation community, construction contractors and others directly or indirectly affected by the project. The Contractor shall keep these objectives in mind when formulating schedules and operational activities. The Contractor shall be responsible for controlling their operations and the operations of subcontractors (at all levels) and suppliers so as to comply with the requirements of this Section.
 - 1. Keep the airport operational for all users
 - 2. Minimize delays to aircraft operations
 - 3. Maintain safety of aircraft movement and airport operations as a whole
 - 4. Minimize delays to construction operations
 - 5. Minimize airport operation and construction activity conflicts
 - 6. Maintain safety of personnel using the airport at all times
- C. Section includes:

ARTICLE	TITLE
---------	-------

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1.02	Definitions
1.03	References
1.04	Related Sections
1.05	Requirements and Regulations Relating to Operation of Motor Vehicles
1.06	Requirements and Regulations Relating to Operators of Motor Vehicles
1.07	Requirements for Orientation of Contractor Personnel and Project Meetings
1.08	Security Requirements
1.09	Safety Requirements
1.10	Interruptions and Stoppages of the Work Due to Aircraft Operations and Hazardous Conditions
1.11	Requirements and Regulations Affecting the Conduct of the Work
1.12	Obstructions to Navigation
1.13	Daily Inspections
1.14	Emergency Procedures
1.15	Administrative Requirements

1.02 DEFINITIONS

- A. Air Operations Area (AOA): That area within the airfield perimeter security fence.
- B. Air or Aircraft Movement Area (AMA): The movement area consists of runways, taxiways and other areas of the airport that are used for taxiing or hover taxiing, air taxiing, takeoff and landing of aircraft, exclusive of loading aprons and aircraft parking areas.
- C. Non-Movement Area: That area of the Airport Operations Area not defined as a movement area and including the exterior of buildings on or adjacent to the non-movement area. Aircraft in motion on these surfaces are not under control of the air traffic control tower.
- D. Apron: That non-movement area prepared for the positioning or parking of aircraft during ground operations not involving landing and takeoff of airplanes. The areas are usually designed according to use, such as terminal, cargo, parking, service hangar, or holding apron. Such terms as "ramp," "hardstand," "turnaround," etc., are synonymous with apron. Other sub-area designations are:
 - 1. Aircraft Parking Positions - used for parking aircraft to enplane and deplane passengers, load or unload cargo.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

2. Aircraft Service Area - on or adjacent to an aircraft parking position. They are used by airline personnel and equipment for servicing aircraft and staging of baggage, freight and mail for loading and unloading of aircraft.
 3. Service/Fire Lanes - identified rights-of-way on apron designated for aircraft ground service vehicles and fire equipment.
 4. Taxi lanes - reserved to provide taxiing aircraft with access to and from parking positions.
- E. Runway: A clearly defined area on the airport that has been prepared and is suitable for landing and takeoff of airplanes. The principal runway elements include the structural pavement, shoulders, blast pads, runway safety area, extended runway safety area and airport imaginary surfaces. The runway drainage system, lighting, marking and areas required for landing aids are also integral design parts of the runway.
- F. Taxiway: A defined path over which airplanes can taxi from one part of an airport to another. It includes the structural pavement, shoulder, taxiway safety area and obstacle-free area.
- G. Vehicle Control Line: A red line bordered on both sides by white lines painted on the ramp parallel to and within 12 feet of the north-south vehicle drive lanes. The vehicle control line is present where movement area surfaces boundary non-movement areas and service roads.
- H. Vehicle Drive Lanes: Identified rights-of-way in the non-movement area designated for vehicular movement on the AOA. Drive lanes are delineated by white lines or traffic markings painted on the pavement.
- I. Terminal Buildings and Support Facilities: Interior of terminal and concourses, and support facilities such as cargo buildings (including exterior of buildings and roofs), which are inside the AOA.
- J. Street-Side of Buildings: Exterior of building and roof on street side, outside of the AOA streets, multilanes, drives, parking garage and remote parking lots. This area is also referred to as the landside of the airport.
- K. Foreign Object Debris (FOD): Any object capable of being ingested into aircraft engines or penetrating aircraft tires. Examples are knives, forks, spoons, hand tools, bolts, nails, nuts, cable, polyurethane, vehicle parts, sand, gravel, paper, rocks, dirt, cans, glass, wood, et al.
- L. Director, Airport Operations: That individual who directs all airfield operations and activities with respect to safety, security, airport rules and regulations, and emergency situations.
- M. Manager-Airfield Security/Airport Security Coordinator: That individual appointed by the General Manager, Airfield Line of Business, who directs all activities with respect to security.
- N. Unsuitable Weather: Atmospheric or environmental conditions which restrict construction activities and effect operation of aircraft while approaching a runway to land; during landing; taxiing between runways, ramps, aprons, hangars, or loading zones; standing by to takeoff; or during takeoff as determined by the General Manager, Airfield Line of Business or the General Manager or his authorized representative. In addition, that atmospheric or environmental condition

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

which may, in the opinion of the Engineer, affect the final outcome, position, or condition of construction work, maintenance work, or improvement of any sort or nature.

- O. Jet Blast: Jet blast is the force of jet exhaust produced by the aircraft engines. The high velocities produced by aircraft engines are capable of causing bodily injury and damage to equipment. The drag and uplift forces produced by jet engines are capable of moving large boulders. A jet engine operating at maximum thrust is capable of lifting a 2-foot boulder 35 feet behind the airplane completely off the ground.

As an example, a DC10 at takeoff thrust can produce a velocity of 750 mph 10 feet behind the aircraft; a velocity of 260 mph 100 feet behind the aircraft; a velocity of 55 mph 1,000 feet behind the aircraft; 10 mph 4,400 feet behind the aircraft. At maximum values these velocities may extend 30' out beyond the wingtips of the aircraft and to a height of 60' above ground level. (This information is taken from FAA Advisory Circular 150/5300-13 Figure 8-4.)

- P. Low Visibility Operations: Low Visibility Operations means movement of aircraft for takeoff landing or taxi when the visibility is reported to be less than 1,200 feet runway visual range (RVR).

1.03 REFERENCES

The rules, requirements and regulations specified in this section have been compiled from the following sources:

- A. Sea-Tac International Airport Operation Rules and Regulations.
- B. Port of Seattle Regulations for Airport Construction, Revision 2004.
- C. Federal Aviation Administration Advisory Circular 150/5370-2E, 150/5210-5B Appendix 1, and 70/7460-1K (Current Edition).
- D. Federal Aviation Regulations (FAR) Part 77.
- E. FAA order NM 5200.3.

1.04 REQUIREMENTS AND REGULATIONS RELATING TO THE OPERATION OF MOTOR VEHICLES

- A. General:
 - 1. During the term of this Contract, the Contractor shall recognize and abide by the following rules and controls as they may be modified by federal regulations.
 - 2. In addition to these regulations, the Engineer is empowered to issue such other instructions as may be deemed necessary for the safety and well being of Airport users or otherwise in the best interests of the Port.
- B. Operation of Motor Vehicles:
 - 1. General:
 - a. Motor vehicle operations within and on the Airport premises shall be governed generally by the provisions of the Washington State Motor Vehicle Codes and Traffic Direction procedures and signals for turns, lights and safe-driving precaution shall be in conformity

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

therewith. In addition, motor vehicles shall conform to all special regulations prescribed by the Commission or procedures imposed pursuant to Commission regulation by the Director.

- b. Traffic on enplaning and deplaning drives, public thoroughfares and parking areas of the Airport is limited to those vehicles properly licensed to operate on public streets and highways.
- c. All vehicular equipment in the AOA, cargo, tunnel, access road, aircraft parking or storage areas shall at all times comply with any lawful signal or direction of Port employees. All traffic signs, lights and signals shall be obeyed, unless otherwise directed by Port employees.
- d. Every person operating motorized equipment of any character on any area shall operate the same in a careful and prudent manner and at a rate of speed posted or fixed by this section and at no time greater than is reasonable and proper under the conditions existing at the point of operation, taking into account traffic and road conditions, view obstructions and consistent with all conditions so as not to endanger the life, limb, or property or the rights of others entitled to the use thereof.

2. Operation of Vehicles Within AOA:

- a. All motor vehicles that enter the AOA shall possess exhaust systems which are protected with screens, mufflers, or other devices adequate to prevent the escape of sparks or the propagation of flame.
- b. Regardless of the time of day, all powered construction vehicles that are equipped with headlights shall operate with the headlights on when the vehicle is in motion on the AOA.
- c. All Contractor vehicles shall be equipped with the following visibility/identification features: 1) Operable yellow flashing beacons, beacons must be lighted during all periods of vehicle operation; 2) 3 foot by 3 foot flags having a checkered pattern of international orange and white squares at least 1 foot on each side (For fabric color specifications see FAA Advisory Circular 150/5210-5C, Appendix A.). Attach flag on top of vehicle with rigid pole so that flag will be visible at all times. Vehicles without beacons/flags will not be permitted to enter the AOA.
- d. No person shall operate any motor vehicle or motorized equipment in the AOA of the Airport unless such motor vehicle or motorized equipment is in a safe and mechanically reliable condition for such operation.
- e. Any person operating equipment in the Air Operations Area shall, in addition to this section, abide by all existing Federal Aviation Administration and other governmental rules and regulations.
- f. No person shall operate any motor vehicle or motorized equipment on the aircraft movement or non-movement areas of the Airport at a speed in excess of twenty (20) miles [32 km/h] per hour, or the

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

posted speed limit, whichever is lower, less where conditions warrant. Designated motor vehicle drive lanes shall be utilized where provided unless specific authorization to the contrary is given by the Engineer.

- g. No person operating a motor vehicle or motorized equipment in the AOA shall in any way hinder, stop, slow, or otherwise interfere with the operation of any aircraft on the Airport.
- h. All aircraft and emergency vehicles have priority over Contractor vehicles. Contractor vehicles shall yield right of way to aircraft and emergency vehicles. Contractor shall ensure that under no circumstances will any contractor or subcontractor or other vehicle associated with the job pass beneath any part of an aircraft or loading bridge, or block the access to any parking gate or delay any aircraft movement.
- i. Vehicles shall remain within established drive lanes. The Vehicle Control Line separates the aircraft movement area (runways and taxiways) from the non-movement area (terminal and aircraft aprons and parking areas). It is prohibited to use runways or taxiways or adjacent field areas unless specifically indicated on the drawings. It is emphasized that the Contractor's authority to operate does not extend to active aircraft movement area. The Contractor shall operate along established haul routes with prior approval of the Director, Airport Operations, or the Director's designee, and the Engineer. No vehicle shall cross the Vehicle Control Line without approval of the Airport Traffic Control Tower and must be in radio contact with the Tower, under escort, or on an established haul route.
- j. Contractor vehicles shall not deviate from approved haul routes specified on the drawings.
- k. Escorts: At all times during work within 250 feet of the centerline of an operating runway or 160 feet of the centerline of an operating taxiway, or when entering or crossing an active movement area, vehicles shall be accompanied by an approved Port of Seattle Escort. All requests for escorts and operations involving an aircraft movement area, or any other activity that may tend to interfere with the general operation of the Airport, shall be approved by the Director, Airport Operations by way of the Engineer. A minimum of 24 hours' prior notice shall be given the Engineer in each case. See Section 01500 - Temporary Facilities and Controls, for submittal requirements.

C. Parking:

- 1. No parking is permitted on any Airport roadway as the primary purpose of the Airport roadways is for motor vehicle traffic.
- 2. No person shall park any motor vehicle, other equipment, or materials in the AOA of the Airport, except in a neat and orderly manner and at such points as prescribed by the contract documents.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

3. No person shall park any motor vehicle or other equipment or materials in the AOA of the Airport within fifteen (15) feet of any fire hydrant or standpipe.
4. Parking of construction workers' private vehicles shall also be within the storage area construction fence located outside the AOA or in a public or private parking facility outside the AOA. Under no circumstances will vehicles or equipment be parked within five (5) feet of the Airport Perimeter Security fence line.
5. Vehicles parked within the AOA shall be chocked or have the parking brake activated.

D. Impoundment of Motor Vehicles:

1. Any vehicle in violation of the provisions as referenced in Chapter 46.52 (Abandoned Vehicles) or Chapter 46.61 (Rules of the Road) of the Revised Code of Washington may be subject to impoundment pursuant to the provisions and procedures contained therein.
2. No vehicle shall be impounded except under the direction of an authorized police officer of the Port of Seattle.

E. Vehicle Identification:

1. All vehicular equipment operating within the AOA must display signs of commercial design on both sides of the vehicle to identify the vehicle as belonging to the Contractor firm. The Contractor's name must appear in letters a minimum of two inches high. Magnetic signs are acceptable.
2. Vehicles that appear at access gates without signs on both sides of the vehicle will be denied access. Vehicles found to be missing signs within the Air Operations Area will be escorted off the job site and not be permitted to re-enter until signs have been installed.

- F. Load Limits: Unless otherwise indicated, when using airport roadways, the Contractor shall restrict the gross combination weight to the legal limits allowed on public roads.

1.05 REQUIREMENTS AND REGULATIONS RELATING TO OPERATORS OF VEHICLES

- A. All drivers operating vehicles on airport property must carry a valid United States driver's license on his/her person, appropriately endorsed for the type of equipment being operated.
- B. All personnel (including drivers) working within the AOA must have a valid Port of Seattle Identification/Access badge. See Section 01567 - Airport Personnel Identification/Access Control for Procedures required for badge issuance.
- C. All personnel working within the AOA shall receive special drivers training and be approved by the Port of Seattle before being allowed to operate within the AOA or be escorted by Port of Seattle approved escort. Personnel operating outside the AOA may operate vehicles without attending the special drivers training course.
- D. Contractors, Subcontractors, Suppliers and Contractor occasional deliveries requiring access to the AOA in support of the contract work that do not have valid

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Port identification shall be escorted by authorized Contractor personnel. The Port will not provide escorts for the Contractor's work.

1.06 REQUIREMENTS FOR ORIENTATION OF CONTRACTOR PERSONNEL AND PROJECT MEETINGS

A. Air Operations Orientation:

1. After Award of the contract has been issued, but prior to the start of the construction, arrange with the Engineer to have all supervisory and job office personnel assigned to this project attend an "Air Operations Orientation." This orientation will be conducted by the Port for discussion of the rules and regulations pertinent to this Contract. The orientation will be repeated at reasonable intervals during the construction period. Port attendees will include the Engineer and the Director, Airport Operations or the Director's authorized representative.
2. The Air Operations Orientation may be conducted as part of the preconstruction meeting and shall not be considered an educational course in Air Operations Safety, but a discussion of existing rules or regulations related to airport activities. The Contractor shall be totally responsible and liable for the actions of his employees, agents, or representatives.

B. Safety and Security Meetings: An airport safety and security meeting will be conducted after the award of the contract and prior to commencing construction. Additional construction safety meetings will be scheduled throughout the life of the contract.

1.07 SECURITY REQUIREMENTS

- A. General Intent: It is intended that the Contractor shall comply with all requirements of the Airport Security Plan (ASP) and with the security requirements specified herein.
- B. Security Identification Display Area (SIDA) Training: Comply with the requirements of Section 01567 - Airport Personnel Identification/Access Control.
- C. Identification/Access Badging: All Contractor personnel shall have Port-issued identification/access badges. See Section 01567 - Airport Personnel Identification/Access Control for procedures required for issuance of Identification/Access badges.
- D. Perimeter Fence Security:
 1. Do not open gates or remove fencing without approval of the Engineer. Adequate precautions shall be taken to prevent entrance of unauthorized persons to Airport-restricted areas or inadvertent entry of dogs or large animals into the AOA.
 2. Prior to securing work each evening, ensure that all access gates which have been opened are closed and locked and that perimeter fencing is restored to a condition that will maintain present security standards.
 3. Five Foot Rule: No Contractor will be permitted to store materials, park equipment or erect permanent or semi-permanent structures within five (5) feet of either side of the AOA perimeter security fence.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

4. Use of Gates: Access to work within the AOA shall be limited to only the gates shown on the drawings. Use of the gates shown for continuous access (in excess of twice per work shift) will require the gate be manned by Port Operations or Security personnel, provided by the Port. Gates for Contractor access during hours of darkness shall be supplied with a light plant and generator whenever the gate is in use. Furnishing, fueling and maintaining the light plants shall be the responsibility of the Contractor. The Contractor shall schedule with the Engineer a minimum of 48 hours prior to requiring continuous access through a gate.
5. Prior to removing or making holes in the Airport perimeter fencing, the Contractor shall obtain permission and written approval from the Engineer, and take adequate precautions to prevent entry of unauthorized personnel or animals.

1.08 SAFETY REQUIREMENTS

- A. In addition to the requirements specified in other sections, the following Safety Requirements shall also apply to the Contractor's activities:
 1. Traffic Control: The Contractor shall furnish all required traffic control to protect the public outside the AOA. The actions, equipment and position of flagmen, when required, shall be the sole responsibility of the Contractor. The Contractor shall provide flagmen and construction traffic control on public facilities in accordance local jurisdiction requirements and the current edition of the Manual of Uniform Traffic Control Devices (MUTCD). See Section 01570 - Traffic Control.
 2. In the event an employee of the Contractor violates a safety provision, they shall be prohibited from returning to work on the AOA without first attending another Airport Safety Orientation class and approval of the Director, Airport Operations. Subsequent violations will be deemed as just and sufficient cause to demand the employee be permanently removed from the job site. The Contractor shall be responsible for all costs and delays caused by safety violation.
 3. Contractor's Designated Representative: The Contractor shall inform its supervisors and workmen of the airport activity and operations that are inherent to this airport, as well as the safety requirements and security regulations of the airport. The Contractor shall conduct its construction activities to conform to both routine and emergency requirements. During the course of construction, the Contractor shall designate a responsible representative who will be personally available on a 24-hour basis. The Contractor shall advise the Engineer of the representative's name and telephone number (the telephone shall not be connected to an answering machine). The Contractor shall comply with all current safety laws, ordinances and regulations as they may apply to this contract.

1.09 INTERRUPTIONS AND STOPPAGES OF THE WORK DUE TO AIRCRAFT OPERATIONS AND HAZARDOUS CONDITIONS

- A. Work Stoppages:
 1. Construction may be stopped by the Director, Airport Operations or the Director's designee, through the Engineer, any time the former considers

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

that the intent of the regulations regarding safety or Security Requirements are being violated or that a hazardous condition exists. This decision to suspend the operation will be final and will only be rescinded when satisfied that the Contractor has taken action to correct the condition and prevent recurrence.

2. Frequent inspections will be made by the Director, Airport Operations or the Director's authorized representative during the critical phases of the work to insure that the Contractor is following the recommended safety procedures. The Inspector shall report any violations or potential safety hazards to the Engineer who will in turn advise the Contractor of the concern for immediate correction by the Contractor.
3. Construction may also be stopped or suspended by Airport Operations through the Engineer during periods of extremely inclement weather, such as low visibility, snow or ice accumulation, or when it is necessary to provide an extra margin of safety to aircraft operations due to other unsuitable conditions, or reduce other activities in favor of conducting snow removal operations required to keep the airport operational.

B. Intermittent Construction Operations:

1. Portions of the work in this contract will occur in the AOA. Heavy construction may require closing of certain areas by the Airport. However, some work may be done on an intermittent basis. The Contractor shall maintain constant communication with the Engineer when working on an AOA location, and immediately obey all instructions from the Engineer. Failure to obey instructions or maintain proper communication will be cause to suspend the Contractor's operations in such areas until satisfactory conditions are assured.
2. When directed to cease construction and move from the area, the Contractor shall immediately respond and move all material, equipment and personnel outside areas. Operations shall not be resumed until directed from the Director, Airport Operations through the Engineer. Every reasonable effort will be made to cause minimum disturbance to the Contractor's operations; however, no guarantee can be made as to the extent to which disturbance can be avoided.
3. Limitation of Operations: The Contractor shall be responsible for controlling its operations and those of its subcontractors so as to provide for the free movement of aircraft in the apron areas of the AOA.

1.10 REQUIREMENTS AND REGULATIONS AFFECTING THE CONDUCT OF THE WORK

A. General:

1. Requirements to Begin Work: Before starting work, the Contractor shall provide and have available all flags, signs, barricades, lights and electrical generators as may be required for the protection of air traffic, vehicular traffic and the construction work. All personnel shall have the proper identification badges and have received the required training and instruction.
2. No hazardous materials will be stored within the terminal complex.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

3. No burning is permitted on Airport property.
4. Smoking by personnel is prohibited on the AOA and inside the terminal.
5. Construction Activity and Aircraft Movements:
 - a. Prior to the start of the construction activities in the AOA affecting aircraft movement areas, the safety requirements relating thereto will be coordinated by the Port between the Director, Airport Operations, air carriers, fixed base operators, other users and appropriate representatives of the FAA. This coordination will be based on the Contractors approved construction schedule with the primary purpose of compliance with the contract document requirements.
 - b. Construction activity and storage of equipment, relating to off-AOA projects are not exempt from all the regulations that govern the AOA. Materials can not be stored in violation of POS security fence set back clearances (5' rule). Activity and storage of equipment may also have an impact on the FAR Part 77 surfaces that are prescribed to protect the airspace associated with the airport.
 - c. Construction work will not be allowed within the safety area of an open runway or within the object free area of an open taxiway (160' from centerline) without prior permission of the Director, Airport Operations or authorized designee. (Refer to 1.12 Obstructions to Navigation.)
6. Limitation of Construction Activities:
 - a. During construction there shall not be lips greater than 1 inch for pavement traveled by aircraft and 3 inches for edges between old and new surfaces at edges and ends not traveled by aircraft.
 - b. Open-flame welding or torch-cutting operations are prohibited unless adequate fire and safety precautions are provided and have been approved by the Fire Department through the Engineer.
 - c. Open trenches, excavations and stockpiled material at the construction site shall be prominently marked with barricades and lights as detailed on the drawings.
 - d. Stockpiled material shall be limited in height and constrained in a manner to prevent movement resulting from aircraft blast or wind conditions.
 - e. The Contractor will ensure that all lighting fixtures are shielded against interference with the vision of pilots and air traffic controllers.
 - f. During non-working hours, all trenches and excavations outside of the barricaded work areas shall be backfilled or covered unless otherwise indicated in the contract documents.
 - g. Non-working hours shall be defined as when construction is not taking place within a work area.

B. Construction Adjacent to Runways:

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1. All equipment and material above the runway centerline grade and within a distance of 250 feet from the runway centerline must be removed when the runway is being used by aircraft unless specifically allowed by the phasing drawings.
 2. Within 250 feet of the runway centerline, all open trenches, lips greater than one inch, and drop-offs greater than three inches must be filled, covered, or sloped when the runway is open.
 3. Notification to the Director, Airport Operations or his representative, by way of the Engineer, is required prior to beginning any construction within the aircraft movement area. Notification of the proposed construction should be made a minimum of fourteen (14) days prior to beginning work.
- C. Construction Adjacent to Taxiways:
1. No equipment or material within 160 feet of a taxiway centerline shall be above the taxiway centerline grade while the taxiway is being used by aircraft unless specifically allowed in the phasing drawings.
 2. Open trenches or abrupt drop-offs may be made adjacent to taxiway pavement edges only as shown on drawings.
 3. Marking and lighting of work areas adjacent to taxiways shall be required and approved by the Engineer.
- D. Barricades and Marking of Barricades:
1. Barricades shall be Multi-Barrier AR-10 X 96 HDPE or approved equal with 6" X 72" orange and white reflective striping on both sides and two integral solar powered flashing red lights.
 2. Barricades shall be installed as shown on the drawings or relocated by the Contractor at the direction of the Engineer whenever the need arises throughout the duration of the Contract. Barricades shall be placed indicated on the drawings to separate active areas from areas under construction. Placement of the barricades shall be in accordance with the drawings and shall be approved by the Engineer.
 3. Barricade lights shall be operative at all times. It shall be the Contractor's responsibility to immediately repair or replace any light or flasher that is not operating.
 4. Barricades shall be in place prior to commencing construction operations, and shall be maintained in good appearance for the life of the contract.
 5. Barricades shall be relocated as directed by the Engineer.
 6. Barricades shall be water filled where shown on the drawings or as directed by the Engineer.
- E. Reflector Markers:
1. Reflector markers shall be of an impact-resistance color impregnated special polymer extrusion that has been UV-stabilized with both ground and pavement mounts. Height shall be 18"; color shall be solid red or orange; or as specified in the specifications for color. Reflectors shall meet FAA AC 5345-39C.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

2. Install reflector markers as shown on the drawings.
- F. Closures: No ramp, apron, taxiway, or runway area shall be closed to aircraft without approval of the Director, Airport Operations through the Engineer. This will enable Notices to Airmen (NOTAMS), or other advisory communications to be issued. A minimum of 72 hours notice of requested closing shall be directed to the Engineer. The Engineer will arrange inspections prior to opening any area to air traffic. Any waste material, and/or debris must be removed from aprons promptly to avoid possible damage to aircraft.
- G. Debris
 1. Debris Control: When Airport roadways and public highways are used in connection with construction under this contract, the Contractor shall remove all debris cluttering the surfaces of such roadways. Trucks and equipment shall have all accumulated dirt, mud, rocks and debris removed before accessing the AOA and when leaving the work area. Loads shall be struck flush and secured to prohibit loss of material. If spillage occurs, such roadways shall be swept clean immediately after such spillage to allow for safe operation of vehicles as determined by the Engineer. If the Contractor is negligent in cleanup and Port forces are required to perform the work, the expense of said cleanup shall be paid by the Contractor.
 2. No loose material or waste (FOD), capable of causing damage to aircraft or capable of being ingested into jet engines may be left in the working area on or next to runways, taxiways, ramps, or aprons. The Contractor shall direct special attention to all areas that are operational to aircraft during construction. These shall be kept clean and clear of all materials or debris at all times.
 3. Food waste on a work site is a safety concern in that it attracts animals and birds that may impact the safe movement and operation of aircraft on the airfield. Food waste shall be promptly removed from construction sites.
- H. Existing Airport Pavements and Facilities: The Contractor shall preserve and/or protect existing and new pavements and other facilities from damage due to construction operations. Existing pavements, facilities, utilities, or that are damaged shall be replaced or reconstructed to original strength and appearance at the Contractor's expense. The Contractor shall take immediate action to replace any damaged facilities and equipment and reconstruct any damaged area that is to remain in service.
- I. Storage Areas:
 1. The storage area(s) depicted on the plans shall be used to store all idle equipment, supplies and construction materials (other than bulk materials such as aggregate, sand and soil). Storage shall not interfere with operational areas.
 2. All material and equipment shall be stored at storage sites indicated on the contract drawings.
 3. Do not store materials or equipment in areas in which the equipment or materials will affect the operation of FAA electronic apparatus.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

4. All equipment storage and movement shall have prior approval of the Director, Airport Operations, or the Director's authorized designee and the Engineer.
5. The perimeter of any storage area that abuts an AOA pavement shall be protected by barricades no more than 10 feet apart marked with red flashing lights. Upon completion of all work, remove all and barricades and lights from the project site.
6. Contractor's vehicles, equipment and materials shall be stored in areas designated on the drawings. Upon completion of the work, the storage area shall be cleaned up and returned to its original condition to the satisfaction of the Engineer.
7. Equipment not in use during construction and during all non-construction hours shall be parked in the Contractor's storage area. All exceptions shall be approved in advance by the Director, Airport Operations by way of the Engineer. Parking of construction workers' private vehicles shall not be allowed within storage areas located on the AOA.
8. Stockpile areas shall be used to store all bulk materials needed for the project and may or may not be fenced at the Contractor's option. However, barricades, as specified herein, shall be installed where potential conflicts with aircraft or ground vehicular traffic exists. Stockpiles shall not penetrate the FAR Part 77 imaginary surfaces or present FOD problems.
9. Equipment and materials shall not be stored between runways. . An exception to this is for tracked construction vehicles/devices, and certain materials that are specified in contract drawings. The height of the equipment and the location where it will be stored must be specified in the drawings.

1.11 OBSTRUCTIONS TO NAVIGATION

The Contractor shall limit the height of vehicles, equipment, stockpiled materials excavated earth, to the limits as specified on the drawings.

1.12 DAILY INSPECTIONS

- A. The Director, Airport Operations or the Director's representative will conduct a daily inspection of each construction site before workers leave for the day to ensure that areas surrounding the sites are safe for aircraft operations. Inspector(s) will be watchful for Foreign Object Debris (FOD) that can be ingested into aircraft engines, loose polyethylene and other light materials capable of being blown onto aircraft movement areas by wind, unlighted construction and obstruction lights, vehicles and equipment left outside construction areas, construction areas left unlocked, access gates left open, weak partitions or fences, etc. All discrepancies shall be corrected before workers depart from the work site.
- B. Inspectors will review potentially hazardous conditions, which may occur during airport construction, and maintenance including, but not limited to the following:
 1. Trenches, holes, or excavation on or adjacent to any open runway or related safety area.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

2. Unmarked/unlighted holes or excavations in any apron, open taxiway, open taxi lane, or related safety area.
3. Mounds or piles of earth, construction materials, temporary structures, or other objects on or in the vicinity of any open runway, taxiway, taxi lane or in a related safety, approach or departure area.
4. Pavement drop-offs or pavement turf lips (either permanent or temporary) which would cause, if crossed at normal operating speeds, damage to aircraft that normally use the airport.
5. Vehicles or equipment (whether operating or idle) on any open runway, taxiway, taxi lane, or in any related safety, approach or departure area.
6. Vehicles, equipment, excavations, stockpiles, or other materials which could impinge upon NAVAID critical areas and degrade or otherwise interfere with electronic signals from radios or electronic NAVAIDs or interfere with visual NAVAID facilities.
7. Unmarked utility, NAVAID, weather service, runway lighting, or other power or signal cables that could be damaged during construction.
8. Objects (whether marked/flagged or not) or activities anywhere on or in the vicinity of airport which could be distracting, confusing, or alarming to pilots during aircraft operations.
9. Unflagged/unlighted low visibility items (such as tall cranes, drills, etc.) in the vicinity of an active runway, or in any approach or departure area.
10. Misleading or malfunctioning obstruction lights.
11. Unlighted/unmarked obstruction in an approach to any open runway.
12. Inadequate approach/departure surfaces (needed to assure adequate landing/takeoff clearance over obstructions or work or storage areas).
13. Inadequate, confusing, or misleading marking/lighting of runways (including displaced or relocated thresholds), taxiways, or taxi lanes.
14. Water, snow, dirt, debris, or other transient accumulation which temporarily obscures pavement marking, pavement edges, or derogates the visibility of runway/taxiway marking, lighting or of construction and maintenance areas.
15. Inadequate or improper methods of marking, barricading, or lighting temporarily closed portions of airport operation areas.
16. Trash or other materials with foreign object damage (FOD) potential, whether on runways, taxiways, aprons or related safety areas.
17. Inadequate fencing or other marking to separate construction or maintenance areas from open aircraft operating areas.
18. Inadequate control of vehicle and human access to and non-essential, non-aeronautical activities on, open aircraft operating areas.
19. Improper radio communication maintained between construction/maintenance vehicles and air traffic control tower or other on-

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- field communications facility (e.g., FAA Flight Service Station (FSS) or unicom radio).
- 20. Construction/maintenance activities or materials which could hamper Aircraft Rescue and Fire Fighting (ARFF) vehicle access from the ARFF stations to all parts of the runway/taxiway system, runway approach and departure areas, or aircraft parking locations.
- 21. Bird attractants such as edibles (food scraps, etc.) trees, brush, other trash, grass/crop seeding, or pond water on or near the airport.
- 22. Personnel at the construction site without proper POS identification.
- 23. No escorts for persons at the job site without proper identification.
- 24. Vehicles involved in the project do not meet the safety requirements of POS Rules and Regulations.
- 25. Improperly marked, lighted and flagged vehicles involved in the project.
- C. All work shifts, including the nightly work shifts are totally inclusive of the Contractor moving onto the site, performing work activities, performing all clean-up, having the work area and haul routes inspected and approved by the inspector(s) and moving off the site. The Contractor shall provide adequate lighting for the needs of the inspection personnel.
- D. Any Aircraft Movement Surface or adjoining runway, taxiway or taxilane safety area that does not pass inspection must remain closed until such time cleanup is performed and approved. Damages will be assessed for any delays in the opening of the surface as defined in Document 00800 - Supplementary Conditions, paragraph SC-10.13.

1.13 EMERGENCY PROCEDURES

- A. The Contractor shall familiarize itself with airport emergency procedures and shall conduct his operation so as not to conflict with such events. Clear routes for Airport Rescue and Fire Fighting (ARFF) equipment shall be maintained in operational condition at all times.
- B. In case of an emergency caused by an accident, fire, or personal injury or illness, Port Police are to be immediately notified by calling 9-911 from airport phone (Port Police Dispatch), 911 from outside phones. Police will coordinate with other emergency agencies as necessary.

1.14 ADMINISTRATIVE REQUIREMENTS

- A. Applicability: The provisions of this section shall apply to the Prime Contractor, subcontractors at all tiers, suppliers and all others which may have access to the Air Operations Area by way of the Contractor's activities.
- B. Exclusion From Claims: Impacts caused by failure of the Prime Contractor, subcontractors at all tiers, and all others to comply, implement and maintain the provisions of this section shall not be cause for a claim of delay or increased cost to the Port.

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Section 01410 - Environmental Regulatory Requirements

PART 2 GENERAL

2.01 SUMMARY

- A. General: The list of environmental laws set forth in this section is provided pursuant to Section 39.04.120 of the Revised Code of Washington. The Contractor shall fully comply with the provisions of such laws as they may apply to the Work.

2.02 LIST OF ENVIRONMENTAL STATUTES, ORDINANCES AND REGULATIONS

- A. General: The following is a list of federal, State and local environmental statutes, ordinances and regulations which deal with the prevention of environmental pollution and the preservation of public natural resources that affect or may affect this Project. This list is not to be considered as all-inclusive, nor shall the absence of a law from this list be construed to relieve the Contractor from complying with such law, to the extent it is applicable to the Contractor.
- B. Federal
 - 1. Statutes:
 - a. National Environmental Policy Act: Establishes a Federal policy on the environment and requires the appropriate Federal agency, in any federally assisted or authorized project, to prepare an environmental impact statement for any "major action significantly affecting the quality of the human environment.
 - b. Clean Air Act: Establishes a Federal policy on air quality and directs each state to promulgate air quality laws and regulations to achieve the goals set forth in the Act.
 - c. Clean Water Act: Establishes a Federal policy on water quality and directs each state to promulgate water quality laws and regulations to achieve the goals set forth in the Act. In addition, the Act requires a permit for discharge of pollutants and sets forth oil spill prevention provisions and penalties.
 - d. Rivers and Harbors Act of 1899: Provides that discharge of refuse without a permit into navigable waters is prohibited.
 - e. Port and Waterways Safety Act of 1972: Provides vessel design and construction standards to protect the marine environment.
 - f. Resource Conservation and Recovery Act: Provides standards and requirements for the generation, transportation, treatment, storage and disposal of hazardous wastes.
 - g. Comprehensive Environmental Response Compensation and Liability Act: Provides standards and procedures for the investigation and remedial activities to clean up hazardous substances which substances that have been discharged into the environment.

Section 01860 - Safety Management

- MC-XXXXXXX /WP #XXXXXXX
Rev. 10/19/11

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- e. Washington Solid Waste Management Law: Establishes uniform State-wide program for handling solid wastes, which will prevent land, air and water pollution.
 - f. Washington Hazardous Waste Disposal Law: Establishes a statewide program for the regulation of the disposal of hazardous waste.
 - g. State Noise Control Act: Authorizes the Department of Ecology to establish maximum noise levels in order to protect against adverse effect of noise in the health, safety and welfare.
 - h. Model Toxics Control Act: State "Superfund" Law which Law that establishes how cleanups of hazardous waste will be managed and sets standards for performing cleanups.
- 2. Regulations and Guidelines:
 - a. Department of Ecology Guidelines for the Implementation of the State Environmental Protection Agency. State guidelines for the implementation of the State Environmental Policy Act.
 - b. Department of Ecology Shoreline Development Permit Regulations: State guidelines for the issuance of shoreline permits.
 - c. Air Pollution Regulations on Record keeping: Requires operators of stationary sources of air contaminants to maintain records of emissions and submit periodic reports.
 - d. Department of Ecology Regulations Relating to Minimum Functional Standards for Solid Waste Handling: Regulations promulgated pursuant to the State Solid Waste Act.
 - e. Department of Ecology Regulations for Waste Discharge Permits: Establishes standards and procedures for obtaining permits to discharge pollutants in navigable waters pursuant to the federal and state Clean Water Acts.
 - f. Department of Ecology Regulations on Dangerous Waste: Regulations promulgates pursuant to the state hazardous waste disposal statute.
 - g. Department of Ecology Regulations Relating to Noise: Regulations establishing noise levels and noise performance standards for certain activities.
 - h. Department of Ecology Model Toxics Control Act Cleanup Regulation: Establishing rules for reporting, listing, investigation and cleanup of hazardous waste sites.
- D. Local:
 - 1. Ordinances:
 - a. City of SeaTac codes and ordinances as agreed to within the City of SeaTac/Port of Seattle 1997 Interlocal Agreement as may be subsequently amended.
 - 2. Regulations and Orders

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- a. City of SeaTac codes and ordinances as agreed to within the City of SeaTac/Port of Seattle 1997 Interlocal Agreement as may be subsequently amended.
- E. Port of Seattle:

2.03 RELATED WORK DESCRIBED ELSEWHERE

- A. Contractual requirements for compliance with environmental statutes, ordinances and regulations:
 - 1. Document 00700 - General Conditions
 - 2. Document 00800 - Supplementary Conditions
 - 3. Section 01631 - Hazardous Materials Management Planning and Execution
 - 4. Section 02270 - Temporary Erosion and Sediment Control Planning and Execution

2.04 REQUIRED SUBMITTALS

- A. Specific submittal requirements are called out in the applicable specification section.

DIVISION 1 - GENERAL REQUIREMENTS

Section 01567 - Airport Personnel Identification/Access Control

PART 1 GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is in accordance with current Department of Homeland Security / Transportation Security Administration (DHS / TSA) regulations.
- B. Failure to comply with TSA rules and the Airport Security Plan may result in up to an \$11,000 fine from the TSA. Fines assessed by the TSA against a Contractor, a Contractor's employee or a subcontractor will be paid by the Contractor.

1.02 SECURITY REQUIREMENTS

- A. Identification/Access Badges:
 - 1. All Contractor personnel working in restricted areas (including AOA, Secured, SIDA and Sterile areas) on this project shall have Port of Seattle airport-issued identification/access badges in accordance with Title 49, Code of Federal Regulations (CFR), Part 1540/1542 and the Airport Security Plan.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

2. A portion of this Contract requires work to be performed within an area of the Airport controlled for security reasons. That area is defined as the area within the Air Operations Area security fence, and all other restricted areas indicated on applicable drawings, or as posted on the Airport premises (“restricted/secured area”), or otherwise defined under Airport Security Plan (ASP). No Contractor personnel are allowed to work in these restricted areas without a valid identification/access badge.
 3. Badges must be worn on the outermost garment above waist height in order to gain access to and remain in restricted areas.
- B. Security Identification Display Area (SIDA) Training:
1. All individuals requiring unescorted access to restricted areas (excluding sterile areas) will be required to attend Security Identification Display Area (SIDA) training in accordance with the Airport Security Plan (ASP) and Title 49, CFR, Part 1542.213 (b). This training must be completed prior to the issuance of an approved ID/access badge allowing unescorted access.
 2. At a minimum, this training shall consist of a forty minute session discussing airport security procedures. The training session shall be conducted by the Port’s Airport Operations SIDA/AOA Training Center. You may pre-register for classes online at www.portseattle.org/sdtrs.
 3. Recurrent SIDA and AOA/Driving Training are required every two (2) years and must be completed prior to badge renewal. If an applicant is authorized to drive on active taxiways (AMA), recurrent training is required annually.

1.03 ISSUANCE OF IDENTIFICATION BADGES

- A. New Company Setup (One time):
1. The Contractor must complete the New Company Setup Application, which is necessary to join the Port of Seattle Identification Program. Each company must make an appointment with the Credential Center and have two representatives present at the time of the company setup. Each representative must complete the badge process and complete the Authorized Signer Training Class. Upon completion of the Authorized Signer Training Class all authorized signers must have a Signature Capture Card on file with the Credential Center. This Signature Capture Card must be signed by an individual designated by the company as an authorizing signatory; e.g., a chief executive officer, owner, senior manager, etc. Authorized Signature Cards must be renewed every two (2) years. To meet current TSA regulations, any Authorized Signatory must hold a current SIDA badge to show proof of clearing all required background checks by the Port of Seattle. All Authorized Signers must attend, at minimum, SIDA training and additional training required by TSA for Authorized Signers. This includes all required recurrent training.
- B. Obtaining an ID Badge (Each employee):
1. Submit a properly completed Identification/Access badge application, Disqualifying Crimes Statement and Privacy Act Notice for each employee requiring access to restricted areas (sample attached to this section).

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

2. The Contractor shall fill out the “Company” portion of each Identification/Access badge application form for each employee requiring access after the employee has completed their section.
3. Each employee requiring access shall fill out the “Applicant” section of the Identification Badge/Access application form. The form shall be signed by the employee.
4. The authorized signer, contractor or delegate shall review the applicant section for accuracy prior to signing and submitting the application to the Credential Center. If required, the contractor will obtain the appropriate co-signatures.
5. Applicants must go to the Credential Center with their completed badge application, badge fees (if applicable), and two forms of identification. One must be government issued PROOF OF CITIZENSHIP. Please refer to : <http://www.portseattle.org/about/employeeservices/idbadges.shtml#id> for a list of acceptable documentation
6. When applications are completed and required documentation has been supplied, the applicant will be fingerprinted in accordance with Title 49, CFR, Part 1542.209. Each applicant will also be submitted for a Security Threat Assessment.
7. Companies will be notified by the Credential Center when their employees have been cleared. They may then return to the Credential Center to pick up their ID badges.

C. Miscellaneous Badge Information

1. Companies initiating badges with the Port of Seattle for the first time, must complete a New Company setup package (available online or in the Credential Center). A onetime fee of \$200 per company will be billed on the first statement.
2. Nonrefundable badge fees are as follows (new badge & renewal)*:

BADGE TYPE	FINGERPRINT FEE	STA FEE	BADGE FEE	BADGE w PRTS	REPRINT
Sterile Area Access	\$28.00	\$3.00	\$53.00	\$81.00	\$15.00
Restricted Area Access	\$28.00	\$3.00	\$73.00	\$101.00	\$15.00
Restrict Plus Driving	\$28.00	\$3.00	\$83.00	\$111.00	\$15.00

Badge fees are subject to annual adjustments. Companies will receive notification of any changes.

3. Any employee working in a U.S. Customs restricted and/or secured area must also contact the Customs Office. To gain access into the U.S. Customs restricted and/or secured area a Contractor must have either a Customs Seal on their Port issued identification/access badge or a temporary badge issued by the U.S. Customs Office. U.S. Customs determines whether a seal is required or a temporary badge will suffice. See Article 1.06 for details.
4. Permanent identification/access badges are valid for two years or the term of the contract, which ever is shorter. Upon expiration of the Contract,

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Contractors must return the badges to the Credential Center or reapply for a new identification/access badge if performing additional work at the Airport.

5. Approval of an Identification/Access Badge Application may be withheld in the event the criminal history records check is found to be unsatisfactory or the applicant is unable to pass any other applicable TSA background checks.
6. The Credential Center is closed weekends and holidays. Special scheduling arrangements may be made if necessary. Hours are subject to change. Appointments must be scheduled for NEW and RENEWAL badges. Each applicant may make their own appointment online at:

<https://app.timetrade.com/tc/login.do?url=portseattle.ca>

- D. All work and expenses required to obtain identification/access badges or for other activities required in this section shall be borne by the Contractor as part of the contract.

E. REQUIRED TRAINING

1. INITIAL TRAINING - All Port of Seattle SIDA badge applicants (either RESTRICTED AREA BADGES or DRIVING BADGES) must successfully complete SIDA training, and if applicable, any required driving training.
2. RECURRENT TRAINING – it is a requirement that all persons renewing Port of Seattle badges successfully complete SIDA training and, if applicable, any required driving training prior to receiving renewed badges.

1.04 RULES AND REGULATIONS REGARDING IDENTIFICATION BADGES

- A. Identification/access badges must be worn at all times on the outermost garment above waist height in order to gain access to and remain in restricted areas.
- B. Any employee found in a restricted area without an airport-issued identification/access badge will be issued a citation and escorted from that location and not be allowed to return until wearing a proper identification/access badge.
- C. Employees shall be allowed access to the restricted areas only as necessary to travel to and from the construction/job site. Any employee found in any portion of the restricted areas other than the construction/job site or the area to and from the construction/job site will immediately have the employee's identification/access badge confiscated and will no longer be permitted to work at the Airport in a restricted area.
- D. All identification/access badges issued by the Port of Seattle are the property of the Port of Seattle and must be immediately returned under the following conditions:
 1. Upon expiration;
 2. Upon separation of employment (for any reason);
 3. When job function no longer requires a Port of Seattle airport-issued identification/access badge;
 4. Upon demand of the Port of Seattle.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

5. If convicted of, or found not guilty by reason of insanity of one of the crimes listed in Title 49, CFR, Part 1542.209 (d). A complete list is on the back of the Fingerprint Application.
- E. The Contractor shall return identification/access badges to the Port immediately after Contractor's employee's badge expires and/or whose work is terminated, or for any of the reasons mentioned above. If badges are not returned within 30 days, the contractor will be charged \$250.00 per non-returned badge.
- F. Escorting:
 1. Any individual with a Port ID authorized access to a particular door/gate, may escort any individual(s) with an airport approved ID but without access to that particular door/gate; e.g., a badge with a lower access level or an escort badge. THE ESCORT MUST REMAIN WITH THE INDIVIDUAL(S) BEING ESCORTED AT ALL TIMES WHILE IN RESTRICTED AREAS.
 2. Proper escort of another vehicle CANNOT be accomplished with the escort riding in the SAME vehicle as the individual being escorted. The escort must be in a separate vehicle from the individual being escorted and both must meet the requirements as stated in Division 1, Section 01140 - Operational Safety on Airports during construction.
 3. Vehicle Signs: Vehicles must have signs of commercial design with lettering at least 2" in height on BOTH sides of the vehicle. Magnetic signs are acceptable. The company name on the driver's badge MUST match the company name on the vehicle.
- G. All badges that are lost, stolen, or otherwise unaccounted for must be immediately reported to the Credential Center at (206) 787-6859 or POS Alarm Response at (206) 787-4022. Any misuse of or willful failure to return a Port of Seattle airport-issued identification/access badge is subject to criminal prosecution. Effective March 1, 2000, a fee of \$250.00 will be charged for a lost or otherwise unaccounted for badge. The fee may be waived if documentation is received and verified from a law enforcement agency specifically indicating the badge was stolen. The Contractor must apply for a replacement identification badge for the employee as provided in Article 1.03; paragraph B, this Section of these specifications.
- H. The Port may withhold final payment to the Contractor for work performed under the Contract until all identification badges have been surrendered or the \$250.00 per badge charge has been paid to the Port of Seattle.
- I. Unsecured Doors: Contractors and their employees will be held accountable for doors located within their work sites that provide direct or indirect access to restricted and/or secured areas of the airport by unauthorized individuals. Doors that provide such access must NOT under ANY circumstances be left open and unattended. Individuals who have been issued Port of Seattle airport-issued identification are required to challenge any individual attempting unauthorized access to restricted areas.
- J. Contractors requiring access through vehicle gates not normally staffed must make arrangements for access through the Aeronautical Duty Manager, (206) 787-5229, who will make arrangements for either Access Controller or Senior Access Controller support.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1.05 FAILURE TO COMPLY

- A. Compliance with these regulations and TSA directives will be monitored by the Airport Security Coordinator, other Airport Security personnel and/or other regulatory agencies. Failure on the part of the Contractor to comply may result in fines or other monetary considerations levied against the Port. In the event an action or absence of action, by the Contractor with regard to the TSA directive leads to any damages against the Port, the Contractor shall be liable for, and reimburse the Port for, all costs involved.

1.06 SPECIAL REQUIREMENTS, WORK IN U.S. CUSTOMS AREA

- A. Work conducted inside areas controlled by the U.S. Customs Service in the South Satellite, may require special clearance and identification issued by the Customs Service. In addition, the Customs Service may require that a bond be provided by the Contractor, as security for all work conducted within their area.
- B. It shall be the Contractor's responsibility to coordinate with the U.S. Customs Service, secure necessary clearance from them, and provide bonds as required. All costs for securing U.S. Customs identification and clearance, and the providing of their required bonding, shall be at the Contractor's expense. No separate or extra payment of any kind will be made to the Contractor for satisfying these requirements.
- C. It shall be the Contractor's responsibility to immediately inform the U.S. Customs Border Patrol (CBP) of badges with a CBP security seal in the following circumstances: upon separation of employment, badge expiration, lost badge, or when the job functions for an individual are complete.
 - 1. Fines will be assessed for failure of notification.
- D. Fines assessed by the U.S. Customs Border Patrol (CBP) against a Contractor, a Contractor's employee or Subcontractor will be paid by the Contractor.

1.07 AIRPORT SECURITY KEYS

- A. Contractors that require keys to perform work at the project work site shall complete a key application form (sample attached to this Section) requesting key(s) and reason for request. Contractors must determine which access points they require prior to submitting the key request. A fine of \$100.00 per key will be assessed for unreturned security keys. Upon completion of the contract, separation of employment or when job function no longer requires use, keys are to be returned. The key deposit(s) will be refunded to the Contractor after return of the key(s). All costs for obtaining airport security key(s) shall be at the Contractor's expense. No separate or extra payment of any kind will be made to the Contractor for satisfying this requirement.
- B. Security keys are tracked via computer and tied to the employee's identification badge number. Security keys cannot be requested in multiples (no more than one per employee). Keys will only be issued to the individual requesting the key(s). An identification/access badge is required prior to issuance.

1.08 ACCESS AUTHORIZATION

- A. Companies must submit an ID Badge Control Authorization Request Form (sample attached to this section) to gain or delete access to controlled entry

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

points. An exact description of the point to include location and door number is required.

1.09 RETURN OF BADGES, KEYS, PERMITS

- A. All badges, keys and permits issued under the requirements of this Section, for this project, must be returned prior to project closeout.

End of Section

DIVISION 1 - GENERAL REQUIREMENTS

Section 01631 - Pollution Prevention, Planning and Execution

PART 2 GENERAL

2.01 SUMMARY

- A. This section consists of planning for and implementing the temporary measures indicated herein, shown on the contract drawings, or as ordered by the Engineer to prevent pollution of soil and water, and control, respond to, and dispose of potential pollutants or hazardous materials during the life of the contract.
- B. This work shall apply to all areas associated with contract work including, but not limited to the following work areas:
 - 1. Jobsite
 - 2. Equipment and material storage areas
 - 3. Staging/Laydown areas
 - 4. Stockpiles

2.02 DESCRIPTION OF WORK

- A. In order to comply with this specification the Contractor shall:
 - 1. Develop and submit a site specific Pollution Prevention Plan
 - 2. Revise the Pollution Prevention Plan during the life of the contract
 - 3. Install, maintain, and remove all spill prevention, containment, countermeasures, and pollution prevention Best Management Practices during the life of the contract
 - 4. Contain, cleanup and dispose of all hazardous materials or potential pollutants
 - 5. Perform other work shown on the contract documents or as directed by the Engineer

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

6. Maintain any required contractor pollution liability insurance including insurance liability for the transportation of hazardous materials for the duration of the contract
7. Maintain a proper Hazardous Material Endorsement for any driver that is transporting hazardous material in a vehicle that requires the driver to maintain a valid and current Commercial Driver's License in the State of Washington

2.03 POLLUTION PREVENTION PLAN

- A. The Contractor shall develop and submit to the Port of Seattle a site specific Pollution Prevention Plan. The Pollution Prevention Plan must be a site-specific document that outlines the administrative, operational, and structural Best Management Practices that will be implemented on the project. Approved BMPs may be found in the Stormwater Management Manual for Western Washington, Department of Ecology, August 2001, or current addition.
- B. The Pollution Prevention Plan must, at a minimum, include the following:
 1. Site specific description and drawings
 2. Contractor pollution prevention contact personnel
 3. Known or potential hazardous materials inventory list
 4. Materials safety data sheets (MSDSs) for hazardous materials identified on the inventory list
 5. Hazardous material containers labeling system
 6. Hazardous material container storage and handling procedures
 7. Hazardous material spill prevention planning and execution
 8. Hazardous material spill control and response planning and execution
 9. Hazardous material cleanup and disposal planning and execution
 10. Subcontractor's acknowledgment

2.04 SUBMITTALS

- A. As part of the required Preconstruction Submittals, Section 01305 - Preconstruction Submittals, and before Notice to Proceed is issued, the Contractor shall submit the following information:
 1. Pollution Prevention Plan and the required contents
 2. Insurance Endorsements verifying liability coverage for job-site work and any transportation of hazardous materials to or away from the jobsite.
 3. Copy of a completed MCS-90 Certificate if required under the Motor Carrier Act of 1980 for transportation of hazardous material which verifies compliance with the financial responsibility requirements of the Act;
 4. A list of all drivers who will be hauling hazardous material in a vehicle that requires the driver to maintain a Commercial Driver's License in the State of Washington under RCW 46.25.080. These drivers must show evidence of a proper Hazardous Material Endorsement in accordance with Washington RCW 46.25.070 and 46.25.085.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

2.05 DEFINITIONS

- A. Absorbent: Any material capable of absorbing oils, water-based materials, solvents, acids, and other hazardous materials. Absorbent materials include: pads, kitty litter, floor dry, and other commercially available materials.
- B. Best Management Practice (BMP): The variety of administrative, operational, and structural measures that will be implemented to prevent and reduce the amount of contaminants in stormwater and the environment. (Example: Providing secondary containment for liquid storage is a BMP).
- C. Container: Any portable device, in which a material is stored, transported, treated, disposed of, or otherwise handled.
- D. Daily Report: The report (form CM03) that the Contractor shall submit daily to include Contractor daily activities.
- E. Dangerous Waste: Solid wastes designated by the State of Washington Under Chapter 173-303 WAC and regulated as Dangerous Waste, Extremely Hazardous Waste, and/or Mixed Waste. (The State of Washington is authorized to implement Federal Hazardous Waste Regulations - see also Hazardous Waste Definition)
- F. Hazardous Material: A substance or material, including a hazardous substance, hazardous waste, marine pollutant, including but not limited to: diesel, gasoline, petroleum products, solvents, paints, acids, lubricants, curing compounds, form release agents, adhesives, sealants, and epoxies. (See also Hazardous Waste definition)
- G. Hazardous Material Storage Area: The area used by the Contractor to store hazardous material.
- H. Hazardous Material Container Labeling System: The system used by the Contractor for identifying the secondary containers used to store hazardous materials or wastes. Acceptable methods include: Department of Transportation (DOT), Hazardous Material Information System (HMIS); National Fire Protection Association Fire Diamond (NFPA Hazard Rating).
- I. Hazardous Waste: Solid wastes designated by 40 CFR Part 261, and regulated as hazardous and/or mixed waste by the United States EPA.
- J. Material Safety Data Sheet (MSDSs): Written or printed material available for each chemical that includes information on: the physical properties, hazards to personnel, fire and explosion potential, safe handling recommendations, health effects, fire-fighting techniques, and reactivity and disposal.
- K. Secondary Container: Any container, other than the original container that is used for transferring, holding, storing or otherwise containing hazardous materials or wastes.
- L. Secondary Containment: A device designed, installed, or operated to prevent any migration of wastes or accumulated liquid to the soil, ground water, or surface water. The device must, at minimum, hold 110 percent of the volume of the largest container being stored. The device must have the strength to contain a spill and be made of materials that will not be degraded by the wastes or accumulated liquids it is intended to contain.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- M. Sorbent: A material used to soak up free liquids by either adsorption or absorption, or both.
- N. Storm Drainage System (SDS): Consists of any drain, inlet, catch basin, slot drain, pipe, gully, fissure, ditch, or other form of conveyance that collects and transports stormwater.

2.06 REFERENCES

- A. The following rules, requirements and regulations specified may apply to this work:
 - 1. Washington State Dangerous Waste Regulations: Chapter 173-303 WAC, February 1998 Edition.
 - 2. National Pollution Discharge Elimination System Waste Discharge Permit No. WA-002465-1 (Seattle-Tacoma International Airport)
 - 3. Part C - Hazardous Communication: Chapter 296-62-054 WAC, "Right to Know"
 - 4. Port of Seattle Regulations for Airport Construction, (Current Edition).
 - 5. Puget Sound Stormwater Management Plan, Puget Sound Water Quality Action Team; 1998.
 - 6. Title 40 Code of Federal Regulation Subchapter I - Solid Wastes 261, 262, 263, 265, 268, 273, 279, 370 (Federal Hazardous Waste Regulations)
 - 7. Sea-Tac International Airport Rules and Regulations (Current Edition).
 - 8. Sea-Tac Airport Stormwater Pollution Prevention Plan, as required by NPDES permit No. WA-002465-1.
 - 9. Seattle-Tacoma International Airport Spill Prevention Control and Countermeasure (SPCC) Plan: January 2003. Kennedy/Jenks Consultants.
 - 10. Stormwater Management Manual for Western Washington, Department of Ecology; August 2001 (or Current Version)
 - 11. Surface Water Design Manual, King County Public Works, September 1998
 - 12. WAC 173-201 A, Water Quality Standards of the State of Washington.
 - 13. Revised Code of Washington - 46.25.085, 46.25.080, 46.25.070, 46.48.170, 4.24.314

2.07 PERMITS

- A. Work shall be conducted in accordance with STIA NPDES permit No. WA-002465-1.

PART 3 PRODUCTS - Not Used

PART 4 EXECUTION

4.01 SITE DESCRIPTION AND DRAWINGS

- A. A written site description shall be included in the Pollution Prevention Plan that addresses the following:

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1. Physical description and location of the construction site and staging areas;
 2. Construction activities that will involve the use of hazardous materials or generate hazardous waste;
 3. Location of material storage areas and project staging areas;
 4. Designated fueling areas;
 5. Proximity to any natural or manmade drainage conveyance including ditches, catch basins, ponds, wetlands, and pipes;
 6. Public areas relating to construction project;
 7. Proximity to other construction sites;
- B. Drawings shall be included in the Pollution Prevention Plan that show the construction site(s), location of fueling areas, equipment storage areas, catch basins and other man-made and natural drainage conveyances within the work area and storage areas. The drawings may be hand drawn sketches but must include the appropriate spatial information.

4.02 CONTRACTOR POLLUTION PREVENTION CONTACT PERSONNEL

- A. The Contractor shall identify in the Pollution Prevention Plan at least one project personnel that will be available 24 hours a day to administer and respond to hazardous materials management requirement of the Contract and provide the following information:
1. Contact Name
 2. Contact Phone Number
 3. Contact Fax Number
 4. Contact Address
- B. Duties
1. Maintain permit file on site at all times which includes the Pollution Prevention Plan, Contractor Erosion and Sediment Control Plan and any associated permits and plans;
 2. Direct BMP installation, inspection, maintenance, modification and removal;
 3. Available 24 hours per day, 7 days per week by telephone;
 4. Update all drawings with changes made to the Pollution Prevention Plan;
 5. Maintain daily logs;
 6. Immediately notify the fire department (911) of any hazardous material spill.
 7. Inspect for Pollution Prevention Plan requirements including BMPs as required to ensure adequacy, facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies, Port employees and Port consultants.
- C. Qualifications

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1. The Pollution Prevention Plan Inspector shall have the following experience:
 - a. Prevention, control and clean-up of construction caused pollution from petroleum, hazardous materials and construction wastes.
 - b. Knowledge of basic hazard and risk assessment techniques.
 - c. An understanding of basic hazardous materials terms.
 - d. Ability to perform basic control, containment and/or confinement operations within the capabilities of the resources and personnel protective equipment available.
 - e. Installation, inspection, maintenance and removal of Pollution Prevention BMPs.

4.03 HAZARDOUS MATERIAL INVENTORY LIST

- A. A complete list of all known or potential hazardous materials or waste to be used or generated during all phases of the construction project shall be included in the Pollution Prevention Plan.

4.04 MATERIALS SAFETY DATA SHEETS (MSDSs)

- A. MSDSs shall be included in the Pollution Prevention Plan for all materials on the Hazardous Material Inventory List.
- B. For all hazardous materials not submitted in the original Hazardous Material Inventory List, the Contractor shall provide to the Engineer a completed Form A-3 and MSDS prior to bringing the material on site and submit a revised inventory list (or plan if required) within 7 days.
 1. Hazardous materials shall be permitted on the work site only with prior written acknowledgement of receipt of Form A-3 and MSDS by the Engineer.

4.05 HAZARDOUS MATERIAL CONTAINERS LABELING SYSTEM

- A. The Pollution Prevention Plan shall address and the Contractor shall implement the following:
 1. Identification of container with a legible label containing the materials product name, as was written on the material's original container label.
 2. Include the name of the material's manufacturer, as was written on the chemicals original container label.
 3. Include appropriate hazard warnings, which identify the chemicals associated risks to health, flammability, or reactivity.
 4. Contractor shall mark each container with the contract project number and company owner of the container.
 5. The mark shall be permanent, easily identifiable and placed with care to prevent defacing of the marker through abrasion, chemical reaction, or other means that would hinder marker identification.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

6. At all times during the Work, the Contractor shall assure that proper and identifiable labels are attached to all hazardous materials and secondary containment

4.06 HAZARDOUS MATERIAL CONTAINER STORAGE AND HANDLING

- A. Solid Chemicals, chemical solutions, paints, petroleum products, solvents, acids, caustics solutions, and any waste materials, including used batteries, shall be stored in a manner that will prevent the inadvertent entry of these materials into waters of the state, including groundwater. Storage shall be in a manner that will prevent spills due to overfilling, tipping, or rupture. In addition, the Pollution Prevention Plan shall address and the Contractor shall implement the following specific requirements:
 1. All liquid products must be stored on durable, impervious surfaces and within a berm or other means of secondary containment capable of containing 110% of the largest single container volume in the storage area.
 2. Waste liquids shall be stored under cover, such as tarps or roofed structures, in addition to secondary containment. Any waste storage areas, whether for waste oil or hazardous waste, shall be clearly designated as such and kept segregated from products to be used on the site.
 3. In the event that the Contract Document Drawings designate a hazardous material storage area, the Contractor shall be restricted to storing hazardous materials or waste specific to the Project work to the area designated in the Contract Document Drawings.
 4. All hazardous materials and waste containers shall be stored with the container lid secured, to prevent spills or leaking.
 5. Upon completion of a specific task for which hazardous material(s) were used, the Contractor shall document in the Daily Report (Form CM03), the amount of hazardous material removed from the site, and the product and manufacturer name(s) of such material(s).

4.07 HAZARDOUS MATERIAL SPILL PREVENTION

- A. The Pollution Prevention Plan shall address and the Contractor shall implement the following:
 1. Hazardous Material Transfer
 - a. All hazardous materials shall be transferred from primary to secondary containers using secondary containment with spill kits in close proximity.
 2. Vehicle and Equipment Fueling-
 - a. All equipment fueling operations shall utilize pumps and funnels and absorbent pads and / or drip pans;
 - b. Fueling shall not take place within 100 feet of any natural or manmade drainage conveyance including ditches, catch basins, ponds, wetlands, and pipes;

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- c. Fueling shall be restricted to designated fueling areas as shown on the contract documents or as submitted and approved by the Engineer as a part of the Pollution Prevention Plan;
 - d. A spill kit will be located within 100 feet of the fueling operation.
 - e. Vehicle and Equipment Maintenance
 - f. Engine, transmission, and hydraulic oil may be added, as needed utilizing funnels and drip pans;
 - g. Absorbent pads shall be placed to prevent fluid contact with soil;
 - h. No fresh or used engine fluids will be stored on the project site;
 - i. No vehicle maintenance other than emergency repair shall be performed on the project site.
- 3. Small Engine Fueling and Maintenance
 - a. All small engine fueling operations shall utilize funnels.
 - b. Absorbent pads shall be placed to prevent fluid contact with soil.
 - c. Fueling shall not take place within 100 feet of any natural or manmade drainage area.
 - d. Contractor shall not drain and replace engine fluids on Port property.
 - e. These fluids may be added, as needed utilizing funnels.
 - f. Fluid addition shall be done over drip pans.
 - g. Absorbent pads shall be placed to prevent fluid contact with soil.
- 4. Equipment Storage
 - a. Drip pans and absorbent pads shall be placed under all equipment that is unused for more than 4 hours, overnights, weekends, and holidays.
- 5. Spill Response Kits
 - a. Spill kits shall be stored at designated locations on the project site and at the hazardous material storage areas and in close proximity to any fueling operation.
 - b. Spill Kits shall, at a minimum, contain the following:
 - (1) 1-spill response procedures sheet
 - (2) 12-oil absorbent pads
 - (3) 12-water-based absorbent pads
 - (4) 1-roll of Visqueen
 - (5) 5-gallons of loose absorbent material i.e. kitty litter or floor sweep
 - (6) 24-heavy duty garbage bags
 - (7) 1-shovel

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

(8) 1-broom

(9) 10-copies spill report form

4.08 HAZARDOUS MATERIAL SPILL CONTROL AND RESPONSE

- A. The Plan shall contain information on how the Contractor shall control and respond to hazardous material spills. At a minimum, the Contractor's employee responsible for the spill must take appropriate immediate action to protect human health and the environment (e.g., diking to prevent contamination of state waters).
1. Hazard Assessment - assess the source, extent, and quantity of the spill.
 2. Containment and personal protection - If the spill cannot be safely and effectively controlled, then evacuate the area and immediately notify outside response services (go to Step 5). If the spill can be safely and effectively controlled, secure the area and proceed immediately with spill control (impacts to waters of the state should be given the highest priority after human health and safety)
 3. Containment and elimination of Source - Contain the spill with absorbent materials or a soil berm around the affected area. Eliminate the source of the spill by closing valves, sealing leaks, providing containment, or deactivating pumps.
 - a. Spill control measures may include damming the spill, covering floor drains, catch basins, and/or preventing the contaminant from entering water systems. Contaminants include turbidity as well as chemicals.
 4. Cleanup - when containment is complete, clean or remove the spill with absorbents or by pumping and containerizing the material for off-site disposal.
 5. Notification - Report all spills immediately to the Port of Seattle Fire Department:
 - a. Port Phone: 911
 - b. External Phone: (206) 787-5380
 - c. Provide the Following Information:
 - (1) Time spill occurred or was discovered
 - (2) Location of the spill and equipment involved
 - (3) Estimated amount of spill
 - (4) Measures taken to contain the spill and secure the area

4.09 HAZARDOUS MATERIAL CLEANUP AND DISPOSAL

- A. The Plan shall contain information on how the Contractor shall characterize, cleanup and remove all hazardous material and waste generated from Contractor operations. At a minimum, the Plan shall include or communicate the following:
1. For the purposes of this section, clean shall be defined as the Work site being free of all hazardous material(s), waste(s) container(s), containment

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- device(s), scrap material(s), used spill pads or absorbent pads, or any other hazardous material debris resulting from the Contractor activities.
2. The Port of Seattle will retain title to all hazardous waste presently on site, encountered during demolition, removal, and excavation. This does not include hazardous materials generated by the Contractor, such as used motor oils, paints, lubricants, cleaners, spilled materials, etc. Contractor will be the generator and owner of these wastes and shall clean and dispose of such waste according to the Contract Documents and follow local, State, and Federal regulations. The Port of Seattle will be shown as the hazardous waste generator and will sign all hazardous waste manifests for non-contractor generated hazardous wastes. Nothing contained within these Contract Documents shall be construed or interpreted as requiring the Contractor to assume the status of owner or generator of hazardous waste substances for non-contractor generated hazardous wastes.
 3. Hazardous material(s) and waste(s) shall be disposed in a fully permitted disposal facility with the approvals necessary to accept the waste materials that are disposed. Use of the Port of Seattle's EPA Identification Number for disposal purposes must be coordinated with the Engineer and all documentation such as manifests, land disposal restriction forms, and profiles must be delivered to the Engineer if the Port of Seattle's EPA Identification number is being used for disposal on the project.
 4. Handling of any contaminated soils shall be coordinated with the Engineer. Contaminated soil stockpiles must be on a plastic liner, covered with plastic and labeled. Unknown contaminated soils must be characterized. Use of the Airport Environmental Soil Stockpile Facility is prohibited unless authorized by the Engineer.
 5. Contaminated materials, such as absorbent materials, rags, containers, gloves, shall be collected and placed into labeled containers.
 6. Any unanticipated hazardous materials, waste, or contaminated soils encountered during construction that are not generated by the Contractor shall be immediately brought to the Engineer's attention for determination of appropriate action. Contractor shall not disturb such hazardous materials or contaminated soils until directed by the Engineer.

4.10 SUBCONTRACTOR ACKNOWLEDGEMENT

- A. The requirements of the Pollution Prevention Plan are the responsibility of the contractor and compliance must be communicated at all tiers of the contract. The contractor must provide a written acknowledgement from all subcontractors that they have read, understand, and will comply with the requirements of the Pollution Prevention Plan. This written acknowledgement must be included in the Pollution Prevention Plan as part of the preconstruction submittal. The subcontractor acknowledgement section of the Pollution Prevention Plan must be updated as needed throughout the life of the contract.

4.11 EDUCATION

- A. The Contractor shall provide narrative in the Pollution Prevention Plan on how they will educate all personnel including subcontractors. At a minimum, the Contractor shall train staff through regularly scheduled meetings to discuss environmental

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

protection subjects as related to this project. This may be added to any existing weekly meetings (such as safety meetings). Training content shall emphasize sensitive areas, emergency response, spill prevention and inspections. Keep minutes of the meetings detailing attendees and subjects discussed. Submit the minutes to the Engineer monthly.

End of Section

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

PART 5 GENERAL

1.01 CONTRACTOR FULLY RESPONSIBLE FOR SAFETY

- A. The Contractor assumes full and sole responsibility for and shall comply with all laws, regulations, ordinances, and governmental orders pertaining to safety in the performance of this Contract. The Contractor shall conduct all operations under this Contract so as to offer the least possible obstruction and inconvenience to the Port, its tenants, the public and abutting property owners. The Contractor shall be responsible for employing adequate safety measures and taking all other actions reasonably necessary to protect the life, health, and safety of employees, the public, and to protect adjacent and Port-owned property in connection with the performance of the Work.
- B. The Contractor shall have the sole responsibility for the safety, efficiency and adequacy of the Contractor's plant, appliances and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the Project Site, including safety of all persons and property in performance of the Work. This requirement shall apply continuously, and is not limited to normal working hours. Nothing the Port may do, or fail to do, with respect to safety in the performance of the Work shall relieve Contractor of this responsibility.

1.02 REFERENCES

- A. The Contractor shall comply with the provisions found in the Port of Seattle Construction Safety & Health Manual, the Federal Occupational Safety and Health Act of 1970 (OSHA), including all revisions and amendments thereto; the provisions of the Department of Safety & Health (DOSH) Washington Industrial Safety Act of 1973 (WISHA); and the requirements of the following chapters of the Washington Administrative Code:
 - 1. Chapter 296-24 WAC General Safety and Health Standards.
 - 2. Chapter 296-62 WAC General Occupational Health Standards.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

3. Chapter 296-155 WAC Safety Standards for Construction Work.
 4. Chapter 296-800 WAC Safety & Health Core Rules
 5. ANSI/ASSE Standards
- B. In addition, the Contractor shall comply with the following requirements when they are applicable:
1. Local Building and Construction Codes.
 2. POS Fire Department Standards
 3. Latest FAA Advisory Circular regarding Operational Safety On Airports During Construction.
 4. Seattle Fire Department Codes
 5. National Electrical Code

NOTE: In cases of conflict between different safety regulations, the more stringent regulation shall apply.

1.03 DEFINITIONS

A. Manager, Construction Safety Services

An employee of the Port or designated consultant who is responsible for the day-to-day management of the Port of Seattle's Construction Safety Program, and such agents, including the Field Safety Manager, as authorized to act in his/her behalf.

B. Field Safety Manager

An employee of the Port or designated consultant who conducts and monitors jobsite inspections and verifies Contractor compliance with identified corrective actions.

1.04 SUBMITTALS

- A. The Contractor shall submit the following information as found in paragraph 1.06 A
- B. The Contractor shall submit a Chemical Exposure Plan for any products containing isocyanates, methylene chloride, Hydrofluoric Acid, lead, silica and processes involving floor sealers, traffic coatings, terrazzo sealers or specialty paints. The plan shall include employee exposure control methods, isolation methods to prevent spread of chemicals outside the work area and safeguarding of the public.

1.05 CONTRACTOR RESPONSIBILITIES

A. SITE SPECIFIC SAFETY PLAN

1. The Contractor shall submit, for the Port's review and comment, a Site-Specific Safety Plan in connection with the Work. The submittal shall be made in accordance with Section 01305, Pre-Construction Submittals. An outline of the matters to be address in the Safety Plan is set forth in Appendix A to this Division. The Port's review of, or comment on, the Safety Plan shall not, in any way, relieve the Contractor of any responsibility or liability for the Safety Plan. Delay in submitting a written

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

safety plan will not constitute grounds for a contract schedule extension or delay claim.

2. The Port will not issue a Notice to Proceed (NTP), until the Safety Plan has been received and accepted by the Engineer and Manager of Construction Safety Services.

B. GENERAL OBLIGATIONS

The Contractor is responsible for accident prevention and job site safety. This responsibility cannot be delegated to Subcontractors, suppliers, the Port, or other persons. To this end, the Contractor shall:

1. Promote a safe and healthy work environment.
2. Provide an accident prevention program.
3. Promote training programs to improve the skill and competency of all employees in the field of occupational safety and health.
4. Instruct all employees of safe work methods and practices when assigning work.
5. Ensure that employees have and use the proper protective equipment and tools for the job.
6. Ensure that all heavy equipment operators (i.e. cranes, loaders and forklifts) are properly qualified and trained on the specific piece of equipment in use.
7. Plan and execute all work to comply with the stated objectives and safety requirements contained in the contract provisions, Federal, State, local laws and regulations, and industry standards.
8. Cooperate fully with the Port and its Consultants and insurers (if applicable) in connection with all matters pertaining to safety.
9. Maintain an orientation program for new employees, including subcontractor employees, that includes at a minimum, a review of:
 - a) Potential hazards in the work areas
 - b) Required personal protective equipment and apparel
 - c) The following prohibited conduct shall result in the immediate removal from the project: gambling, fighting or horseplay, possession of firearms, alcohol or illegal use, possession or sale of a controlled substance or being under their influence.
 - d) Emergency procedures
10. Perform daily inspections of the project, documented on the Construction Safety Inspection Report (Appendix D), review and direct immediate action to correct, any substandard safety conditions or practices, including those of any Subcontractor, regardless of classification. The Contractor shall specifically respond in writing to any substandard safety conditions or practices identified by the Port or its designated Representative.
11. Hold a minimum of one weekly scheduled safety meetings with its employees. Such meetings shall include a discussion of all observed

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

unsafe work practices or conditions, a review of the accident experience and all corrective actions. The Contractor shall encourage safety suggestions from employees.

12. Hold a minimum of one monthly all-hands safety meeting with its employees, and subcontractor employees - subcontractors at any tier. An agenda shall be prepared and distributed for this meeting. The meeting shall include a safety update, and pertinent safety information for upcoming work. The Contractor shall encourage input and involvement from the subcontractors.
13. Ensure prompt medical treatment is administered to any injured employee.
14. Undertake a complete investigation of all accidents and implement corrective action to prevent a recurrence.
15. Prepare and implement a site safety plan as set forth in Paragraph 1.06. A hereof.
16. Comply with the Administrative Procedures set forth in Paragraph 1.09 hereof.
17. Provide the Engineer and Manager of Construction Safety Services with copies of all DOSH citations immediately upon receipt.
18. Ensure that all of its subcontractors, suppliers, etc., are provided with a copy of this specification and are informed of their obligations regarding safety.
19. Ensure that all Contractor and subcontractor personnel at any tier have completed a one and one-half (1 ½) hour Port of Seattle safety orientation to be held by the Port of Seattle at a time and location to be specified by the Port, prior to commencing work. The time expended and any associated costs such as travel time, parking, and other expenses are to be borne by the Contractor.

C. CONTRACTOR SAFETY REPRESENTATIVE

1. It is recognized that the responsibility for safety lies with the Contractor. Each Contractor shall appoint an individual(s) responsible for safety on each contract. This individual(s) must be employed in a supervisory position, empowered by their employer to take corrective action; be present on the project while work is being performed; and spend the amount of time necessary to ensure the Contractor's compliance with safety requirements.
2. A safety inspection shall be performed and documented for each shift worked, by the Contractor's safety representative.
3. The Contractor shall submit a resume of the experience and qualifications for the proposed Safety Representative(s) as part of the Safety Plan submittal. Please refer to part D. Definitions, subparagraphs 1 and 2 below. The Port will review the resumes and a personal interview may be required. The Port may reject anyone it deems "Not Qualified."

D. DEFINITIONS

1. Fulltime Safety Professional qualifications include:

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- a) Shall have no other duties.
 - b) An individual possessing a minimum of five years progressive experience managing safety programs on large construction projects comparable to this contract in scope and complexity.
 - c) Be knowledgeable concerning all federal, state, and Port of Seattle regulations applicable to construction safety.
 - d) Possess “Competent Person” certification in construction safety disciplines related to the work performed and possess verifiable training. This individual shall also be responsible for identifying “Competent Persons” required by State and Federal safety standards for which they are not certified.
 - e) Have successfully completed the OSHA 500 Safety and Health Course. This requirement may be waived in lieu of a safety and health degree or professional safety certification.
 - f) Training and current certification for CPR and First Aid is preferred.
 - g) Be capable of performing accident investigations and developing a concise report.
 - h) Is proficient in the development and presentation of “tool box” meetings and safety training.
2. Site Safety Officer qualifications include:
- a) An individual assigned to perform safety functions on any contract not requiring a Fulltime Safety Professional. This can be a collateral duty position held by a supervisor. Safety duties shall take priority over other collateral duties.
 - b) Possess a minimum 5 years progressive experience in their trade.
 - c) Be knowledgeable concerning all federal, state, and Port of Seattle regulations applicable to safety.
 - d) Have successfully completed the OSHA 30-hour Safety & Health Course.
 - e) Possess “Competent Person” certification in construction safety disciplines related to the work performed and possess verifiable training. This individual shall also be responsible for identifying “Competent Persons” required by State and Federal safety standards for which they are not certified.
 - f) Be trained in, and possess current certification for CPR and First Aid.
 - g) Possess verifiable training and be capable of performing accident investigations and developing a concise report.
 - h) Possess verifiable training in the development and presentation of “tool box” meetings and safety training.

E. DETERMINATION

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

1. When the number of personnel on any shift is under 40 (including Subcontractor employees), the Contractor's safety representative will meet the definition of "Site Safety Officer" as defined above for each shift.
2. For Contractors with a total of 40 or more personnel (including Subcontractor employees) on any shift, a Fulltime Safety Professional as defined above shall be required for each shift.
3. For each additional 75 employees (including Subcontractors employees) on any shift, a second Fulltime Safety Professional shall be required.
4. At the Port's discretion the requirements for Contractor safety personnel can be reviewed and action taken to decrease or increase the number of individuals.
5. The Contractor Safety Officer/Professional (s) shall be primarily responsible for ensuring Contractor's compliance with the safety requirements provided in this Division. Without limiting the generality of the foregoing, the Contractor Safety Officer/Professional (s) shall:
 - a) Review all subcontractor and sub-tier contractor's Site Specific Safety Programs and Job Hazard Analysis (JHA) for compliance with applicable POS Construction Safety, State and Federal Standards and ensure that they receive a copy and are briefed on Document 01860 - Safety Management.
 - b) Perform a site-specific safety orientation for all employees, subcontractors and sub tier contractors prior to beginning work. This is in addition to the Port's safety orientation.
 - c) Perform daily safety inspections of the Contractor and Subcontractor's project to evaluate the project for unsafe conditions and/or practices, and take the appropriate corrective action when required.
 - d) Immediately report all injuries of personnel, vehicles, "Near Miss" incidents and property damage to POS Manager, Construction Safety Services and insure immediate corrective action is taken. Assist in the preparation of all accident investigations and ensure reports are submitted within 24-hours.
 - e) Ensure meaningful, weekly safety meetings are held for all on-site employees. Provide the job foremen with appropriate training materials to conduct weekly "tool box" safety meetings and attend safety meetings to evaluate their effectiveness. Maintain documentation of topics discussed and attendees, with copies submitted to the Engineer or included with Contractors Daily Construction Report.
 - f) Be responsible for the control, availability, and use of necessary safety equipment, including personal protective equipment and apparel for the employees.
 - g) Shall attend a monthly safety committee meeting scheduled by the Manager of Construction Safety Services to discuss and resolve

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

relevant issues related to safety and health on Port of Seattle projects.

6. Contractor Safety Officer/Professional (s) not performing their duties in accordance with this document, shall be replaced at the Port's discretion by an individual meeting the requirements of this section. In addition, the Contractor Safety Officer/Professional (s) may not be removed from this contract or replaced without the Port's advanced written approval. The Contractor shall notify the Engineer and Manager of Construction Safety Services when this person cannot be on duty while work is being performed and shall submit the name(s) and qualifications of the individual assigned to perform said duties.

F. ACCIDENT PREVENTION

1. The Contractor has the responsibility to correct hazardous conditions and practices. When more than one Contractor is working within a given job site, any project management personnel shall have the authority to take action to prevent physical harm or significant property damage. If it is determined there is "Imminent Danger" the Contractor shall:
 - a) Take immediate action to remove workers from the hazard and stabilize or stop work until corrective actions can be implemented to eliminate the hazard.
 - b) Immediately identify and implement corrective action to eliminate the hazard.
 - c) Immediately notify the Engineer, and Manager of Construction Safety Services or others as necessary. The Engineer will notify the proper authorities if the damage cannot be promptly corrected and could develop into an emergency.
 - d) Each worker shall immediately report any condition suspected to be unsafe or unhealthy to their job foreman or safety representative. If there is no resolution of the concern at that level, the employee shall report the concern to the Engineer and Manager of Construction Safety Services.

G. ON SITE FIRST AID

1. At least one person shall be available at the work site at all times to render first aid. This person must have a valid certificate in first-aid training from the American Red Cross, or equivalent verifiable training program. A minimum ratio of one such qualified person for every 25 employees shall be maintained throughout the project. Additionally, the Contractor shall:
 - a) Post emergency procedures which shall include telephone numbers and locations of facilities including, but not limited to, hospitals, physicians, police, fire and emergency medical services, in conspicuous locations at the job site and at all telephone locations.
 - b) Provide in a readily accessible location, first-aid supplies of sufficient size and number to handle common first-aid incidents.
 - c) Identify personnel qualified to render first aid with suitable emblems affixed to the rear of their hard hats for identification.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- d) Regularly discuss actions to be taken during emergencies with the Contractor's supervisory personnel and at "tool box" safety meetings.

1.06 PORT OF SEATTLE'S RIGHTS

A. INSPECTIONS/INVESTIGATIONS

1. The Port may, in any reasonable manner, observe and inspect the Contractor's safety and accident prevention procedures for all activities and personnel working at the construction sites, including the Contractor, subcontractors, visitors, and materials or equipment suppliers. This specifically includes, but is not limited to, the right to attend all safety meetings.
2. The Port shall receive copies of any daily Construction Safety Inspection Reports (Appendix D) completed by the Contractor or anyone performing work for, on behalf of, or under the Contractor.
3. The Port shall receive written copies of accident or incident reports completed by the Contractor within 24-hours of occurrence, using the accident investigation reports found in the Port of Seattle Construction Safety & Health Manual or contractor equivalent. This reporting shall include but not be limited to those reports prepared pursuant to OSHA and/or DOSH regulations.
4. The Port may, in any reasonable manner, observe or participate in any accident investigation conducted by the Contractor or anyone performing work for, on behalf of or under the Contractor. The Port may also, at its sole discretion and in any reasonable manner, undertake its own accident investigation.

B. CORRECTIVE ACTIONS/STOP-WORK

1. The Port shall have the right to require the Contractor to address unsafe working conditions, including taking corrective action when unsafe working conditions are observed (i.e., lack of good housekeeping practices, use of equipment in obviously poor condition, failure to adhere to statutory construction regulations, etc.).
2. The Port shall have the right to require the removal from the work site of any person, property or equipment that, in the Port's opinion, is deemed unsafe.
3. The Port shall have the right to require the Contractor to immediately cease any action and/or stop the Work (or any portion thereof) in the event that any condition exists that, in the Port's opinion, constitutes an imminent danger or serious harm.
4. The Port shall have the right to suspend the Work (or any portion thereof) pending the completion of any accident/incident investigation, whether undertaken by Contractor, the Port or others.

C. PORT'S ACTION/INACTION DOES NOT RELIEVE CONTRACTOR

1. Nothing the Port may do, or fail to do, with respect to safety in the performance of the Work shall relieve the Contractor of its responsibility to

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

comply strictly with this Division and all standards referenced in Section 1.02 of this document.

D. PORT'S ACTION/INACTION NO BASIS FOR ADJUSTMENT

1. The Port's exercise of any rights under this Paragraph 1.07 shall not be a basis for any adjustment in the Contract Price or Time.

E. PORT OF SEATTLE INCLUDES CONSULTANTS

1. As used in Document 01860, the terms "Port of Seattle" and "Port" specifically includes the Port's designated consultants.

1.07 PORT MANDATED SAFETY REQUIREMENTS

- #### A.
- Prior to Notice to Proceed (NTP), the Contractor's Project Manager and Safety Representative shall meet with the Engineer and Manager of Construction Safety Services to review and discuss the safety requirements of this contract.

B. SPECIFIC SAFETY PROVISIONS

1. In addition to Federal, State, and Local regulations pertaining to operations and safety, the Contractor shall adhere to the following Port mandated safety requirements:
 - a) Asbestos and Contractor Personnel Asbestos Training: Ensure that all workers have received the initial and annual Asbestos Awareness training prior to the start of work.
 - b) Entry into Confined Spaces: Work on this project may require entry into confined spaces as defined by WAC 296-809. The Contractor shall read and follow the requirements of the Port of Seattle's Confined Space Entry Program, as found in the Port of Seattle Construction Safety and Health Manual. The Contractor's Confined Space Entry Program must meet or exceed these requirements.
 - 1) The Contractor shall provide the Engineer a copy of its Confined Space Entry Program as part of the Contractor's Safety Plan Submittal. As part of this submittal, the Contractor shall complete the "Confined Space Entry Program Certificate" (Appendix B).
 - 2) Should the Contractor employ subcontractors to work in confined spaces it shall be the Contractor's responsibility to submit the required documentation for each subcontractor.
 - 3) No work shall be allowed to start in a confined space until the required submittals have been made. In the event the Contractor does not comply with these regulations, ACCESS WILL BE DENIED and the Engineer notified. Delays caused by failure to submit the required documentation shall not be considered a reason for extension of contract time.
 - c) Electrical - Safe Clearance Procedures

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- 1) Entry into High Voltage Areas: Work on this project may require entry into manholes, vaults, electrical rooms or other High Voltage areas.
- 2) In the event entry is required, the Contractor is obligated to identify any High Voltage areas that may be involved in the project and immediately notify the Engineer if they have not been properly identified. Before entry into a High Voltage work area the Contractor shall notify the Engineer and contact STIA Electrical Shop at (206) 787-5311(Airport) or the Seaport Electrical Shop at (206) 787-3350.
- d) Fire Prevention: The Contractor shall ensure that fire prevention measures on-site are in accordance with OSHA, DOSH, NFPA and POS standards. Approved safety cans shall be used for flammable and combustible liquids. Signs and fire extinguishers shall be provided where required.
- e) Traffic Control: Ensure compliance with Section 01570 - Traffic Control.
- f) Hazardous Materials: Ensure compliance with Section 01631 - Pollution Prevention Planning and Execution.
- g) Open Flame Devices: Prohibit the use of unapproved fuel-burning types of lanterns, torches, flares or other open-flame devices on Port property.
- h) Hot Work Permit:
 - 1) Seaport: Open Flame Welding and spark producing equipment and tasks require the Contractor to implement a formal "Hot Work Permit" Program outlined in the Port of Seattle Construction Safety and Health Manual. Cutting and Welding tasks also require the Contractor to secure a "Hot Work Permit" from the Seattle Fire Department in accordance with Document 00800, Article SC-04.11.
 - 2) Airport: Open Flame Welding and spark producing equipment and tasks require the Contractor to secure a "Hot Work Permit" from the Port Of Seattle Fire Department in accordance with Document 00800, Article SC-04.11
- i) Liquid propane storage and use below grade is prohibited.
- j) Excavating & Trenching: Coordination with the Engineer shall be required for work performed on the site.
- k) Construction activities that pose a potential risk of exposure to contaminated soil (such as excavations) shall be supervised by personnel who have both a current 40-hour Hazardous Waste certification, and an 8-hour Hazardous Waste Supervisor's certification. These individuals shall be able to identify the potential need for upgrading the level of health and safety protection. All personnel working in direct contact with contaminated soil shall have a current 40-hour Hazardous Waste certification and medical

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

monitoring, as required in Hazardous Waste Operations, Chapter 296-843 WAC and in accordance with OSHA regulations. The plan shall also include emergency procedures and medical treatment, fire protection, Job Hazard Analysis (JHA), and PPE requirements.

- l) The Contractor is responsible for soil sampling and air monitoring to determine hazards and exposures to their employees.
- m) Safety plan shall include guidelines for the protection of construction-related workers against occupational musculoskeletal injury risk factors arising from operations connected with the construction, maintenance and repair, and demolition of structures, using a hierarchy of controls. Manual Material Handling, Body Positioning and Dynamic Stretching shall be addressed. Contractors will need to consult with their Safety Professionals to determine which tasks require an ergonomics prevention program and which selection of controls are needed to minimize injury.
- n) As defined in WAC 296-155 – Part L, individuals involved in operating hoisting equipment, including but not limited to cranes, boom trucks, and forklifts so configured, shall possess recognized certification. Additionally, qualified riggers and signal persons shall also possess recognized certifications. Copies of the certification(s) shall be submitted in accordance with Section 01305 - Pre-Construction Submittals.
- o) Personal Protective Equipment Policy: To reduce the possibility of injuries, the Contractor shall implement a policy that requires 100% use of hardhats, safety glasses, and gloves for all personnel under their control. It is the responsibility of the Contractor to supply the proper personal protective equipment for the task.
- p) Protection of the Public: The Contractor shall submit a plan for the protection of the public on or adjacent to construction and demolition operations. This plan shall include, but not be limited to, barricades, fencing, and signage. "Public" is defined as anyone not associated with the project - general public, POS and tenant employees.
- q) At the Port's request, provide safety awareness training for Contractor supervisory personnel and Port management in one or more of the following: cranes & rigging, electrical, fall protection, trenching & excavation, steel erection, heavy equipment, public protection.
- r) AOA Operations: Ensure compliance with Section 01140 - Operational Safety on Airports during construction.
- s) Foreign Objects Debris (FOD): Ensure compliance with Section 01140 - Operational Safety on Airports During Construction.

C. DISCIPLINARY ACTION MATRIX:

1. Defining "The Plan"

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- a) The object of this matrix is to consistently and effectively control safety hazards such as unsafe acts, and unsafe conditions that lead to injuries of employees, the general public, or that cause property damage.
 - b) The matrix also provides a basis for the Contractor's program by standardizing how safety infractions committed by those employees will be handled.
 - c) All employees of the Contractor, subcontractor, sub tier contractor, vendor, or tenant are covered under this matrix regardless of classification.
 - d) Damage to equipment or property due to unsafe act or using damaged equipment.
 - e) Listed are the minimum requirements for discipline. The Contractor has the right to incorporate more stringent procedures from their corporate policy into this matrix. The Contractor shall not submit two Disciplinary Action Programs.
 - f) Individuals observed by the Contractor's management shall be disciplined under this matrix.
 - g) Individuals observed by the Port of Seattle management shall also be subject to disciplinary action. POS management shall immediately contact the Contractor's management or provide written information to the Contractor's management as to violation, time, date, employer, and employee.
 - h) The Contractor's Safety Manager shall perform the act of documenting and distributing the "Written Violation Notice."
2. Defining "Violation"
- a) Violations are defined as:
 - b) "General Violations" are considered to be those infractions that may not cause serious injury or illness to an individual but are still violations of written safety policies and procedures. Examples include housekeeping, unregulated ACM incidents, property damage, mushroomed tools, etc. "General Violations" do not necessarily require a written warning unless they become classified as "Repeat Violations."
 - c) "Serious Violations" are those violations that if left uncorrected could cause serious injury or illness to an individual. Examples include employees exposed to fall or impalement hazards or serious bodily harm.
 - d) "Imminent Danger" are violations/situations that will most likely cause permanent disability or death to an individual. Examples can include falls, electrical, or trenching hazards and unsafe equipment.
 - e) "Repeat Violations" are situations that arise as a result of a previously identified infraction not being abated in the time frame required or numerous violations of the same classification. "Repeat

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Violations” can also be defined as a situation where one supervisor has multiple employees working under their direction who are in violation of a written Federal, State, project, or company policy.

- f) Violations are not limited to the examples listed above.

NOTE: An “employee” may be removed from the project at any time for a safety violation that endangers his life or the life of a fellow employee.

3. Defining “Employee”

- a) As mentioned earlier, all employees of the Contractor, subcontractor, vendor, or tenant are included in this program.
- b) Job title classifications can include but are not limited to trades person, foreman, supervisor, superintendent, etc.
- c) Any person (s) directly reprimanded for their own actions or inactions, regardless of their position, shall be reprimanded as a “Worker.”

4. Defining the “Procedure”

- a) Individuals observed committing infractions of written Federal, State, site, or company safety policies shall be brought to the attention of the Contractor’s management.
- b) The contractor shall in a timely manner, notify the identified employee(s) that they are in violation of written safety rules or procedures and shall abate the hazard.
- c) In the event of “Imminent Danger or” a “Serious Violation”, the Contractor or POS shall immediately notify and remove the employee(s) from the hazardous situation.
- d) The Contractor shall provide timely written warning to the identified individual(s), as well as the direct supervisor and superintendent of that individual(s). The supervisor’s names shall be recorded on the “Written Violation Notice.”
- e) To discourage “Repeat Violations” or supervisor apathy, the supervision is subject to disciplinary action as stated in the matrix.
- f) The Contractor shall utilize the “Written Violation Notice” provided in this section.

5. Defining the “Results”

- a) Personnel (including supervisors) receiving a Written Violation Notice shall be retrained in the appropriate standard or procedures. Said training shall be documented in writing and submitted to the Engineer.
- b) Written Violation Notices received will remain in force for the duration of the project.
- c) Removal from the project of an “employee” for a minimum of 3 working days.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- d) Removal of an “employee” from any port of Seattle project for one year.
- e) Written notice sent to the appropriate corporate president.
- f) Copies of all “written violation notices” are to be submitted to the Engineer with a copy forwarded to the Manager of Construction Safety Services within 24-hours of issuance of notice.

DISCIPLINARY ACTION MATRIX

FOCUS POINT /INCIDENT	1ST VIOLATION	2ND VIOLATION	3RD VIOLATION	NOTES
Worker	Verbal & Written Notice	3 Days Off	Removed From POS Projects For One Year	
Worker’s Direct Foremen	Written Notice	Written Notice	3 Days Off	3 Worker Lay-offs = Removal From POS Projects For One Year
Worker’s Direct Superintendent	Written Notice	Written Notice	Written Notice to Sub/Prime Superintendent and President of Sub/Company	3 Worker Lay-offs = 3 Days Off For Superintendent
Prime Contractor’s Superintendent	Written Notice	Written Notice	Written Notice to President of Prime Company	3 Worker Lay-offs = 3 Days Off For Superintendent*

*Document 01860 - Safety Management/1.07/B, this individual may also be removed from the project.

DISCIPLINARY ACTION MATRIX

WRITTEN VIOLATION NOTICE

PROJECT NAME: _____ PROJECT #: _____

CONTRACTOR: _____

EMPLOYEE BEING REPRIMANDED _____

DATE: _____ TIME: _____

VIOLATION:

TASK BEING PERFORMED:

CORRECTIVE ACTION/TRAINING REQUIRED:

WITNESS: _____

FOREMAN: _____

SUPERINTENDANT: _____

GC SUPERINTENDANT: _____

FIRST NOTICE: _____ SECOND NOTICE: _____ THIRD NOTICE: _____

EMPLOYEE LAY-OFF OR REMOVAL REQUIRED (YES/NO): _____

WRITTEN NOTICE TO COMPANY PRESIDENT REQUIRED (YES/NO): _____

ISSUED BY: _____ COMPANY: _____

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

D. SAFETY PERFORMANCE

If the Contractor experiences ongoing safety concerns such as a Lost Work Day Case or Recordable Incident Rate greater than the Bureau of Labor Statistics National Average for Construction, experiences repeated violations of safety & health rules and regulations or “Imminent Danger” situations, or fails to abate violations in a timely manner, the Contractor shall be subject to the following action at the Ports discretion:

1. Removal and replacement of management personnel.
2. Submit a written Safety Recovery plan to the Engineer and Manager of Construction Safety Services detailing what changes will be made to their safety program and a timeline as to when the changes will be implemented.
3. Hiring an independent safety consultant who shall audit the Contractor’s procedures and operations. The consultant shall compile a plan detailing what changes the Contractor shall implement. This report shall be submitted to the Engineer, Construction Manager, and Manager of Construction Safety Services.
4. Notwithstanding 01860 paragraph 1.06 (B)(9)(c), Disciplinary Action Matrix, above in 1.08 (B)(2), shall be used for determining the appropriate corrective action.
5. Conduct a “Safety Stand Down” (suspend all work or any portion thereof) in accordance with the provisions of the General Conditions, Article G-10-04. Suspended work shall not be allowed to resume until the Contractor has completed the following actions for review and acceptance by the Engineer:
 - a) Hazardous conditions leading up to the Safety Stand Down shall be abated.
 - b) Training of such type and duration shall be conducted to educate personnel on the awareness of, identification of, and correction of hazards leading up to the stand down.
 - c) Document the completion of items a. and b. above.

E. TOUR GUIDELINES

1. It is imperative that the highest degree of protection is afforded to all individuals touring any Port construction site. The following guidelines have been prepared as general instructions for the organization, direction and safe conduct of such tours:
 - a) Escorted Visitors: While on the job site, non-construction personnel or groups shall be accompanied at all times by an authorized representative, the Engineer, the Contractor or other designee familiar with the job site.
 - b) Notification and Tours: Personnel tours including technical inspections need to be cleared through the Engineer, allowing maximum advance notice. The Engineer shall be consulted to

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

coordinate the tour plan, identify specific rules, and to ensure necessary safety precautions are taken.

- c) Safety Enforcement: Before entering a job site, all visitors must be informed regarding the need for careful, orderly conduct and notified of any special hazards that may be encountered.
- d) Personal Protective Equipment: All visitors and tour groups must comply with proper dress, footwear, personal protective equipment or other safety requirements deemed appropriate.

1.08 CONTRACTOR ADMINISTRATIVE PROCEDURES

A. PROJECT SAFETY INSPECTIONS

1. Unsafe conditions or acts having the potential to cause bodily injury or property damage are classified as either “Imminent Danger” or “Serious.” In either case, action shall be taken immediately to correct the situation. Any item(s) that cannot be corrected immediately are required to be abated within 24-hours of notification. In the interim, other steps shall be taken to insure the safety of employees or the public.
2. The Port’s Construction Safety Inspection Report is required for recording any unsafe conditions or acts noted (see Appendix D). This Report shall be used by anyone performing a documented inspection of a project site.

Contractor may use their own site inspection form daily and summarize findings on a weekly basis on the POS Construction Safety Inspection Report. This report is to be submitted to the Engineer on a weekly basis.

The following instructions apply to the use of this form:

- a) Detailed Information: The information at the top of the form is required and shall be completed by the individual conducting the inspection.
- b) Item Number: Number each item beginning with 001.
- c) Print legibly using a ballpoint pen.
- d) Safety Violation: Provide specific information such as “9 ft section of top rail broken at the Smith Avenue escalator entrance, repair.” Give the exact location of the violation.
- e) Reference: The individual conducting the inspection shall document the proper safety regulations.
- f) Contractor’s Corrective Action: The Contractor shall note the action taken to abate the violation. If an item is abated immediately, it will be so noted on the report.
- g) Date Corrected: The Contractor, upon abatement shall enter the date in the appropriate column.
- h) Report Prepared By: The person conducting the inspection shall sign and date the form.
- i) Submittal Procedure:

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- 1) A copy of the inspection form shall be submitted to the Contractor's Project Manager or designated representative. This will be accomplished through e-mail from the Port's Construction Safety Services department. Copies will also be routed to the Engineer via e-mail.
- 2) When corrective action has been completed, the Contractor's Project Manager or Designee will sign and date a copy of the form (electronic or hard), forwarding it to the Engineer.
- 3) A member of the Engineer's staff will review the form and follow-up to insure that the "Contractor's Corrective Action" has been addressed, initialing each item corrected.
- 4) The Engineer will discuss the noted violations at the weekly Contractor progress meeting.
- 5) The signed copy of the form (electronic or hard) shall be returned to the Manager of Construction Safety Services within five working days.

B. ACCIDENT INVESTIGATION AND REPORTING PROCEDURES

1. All accidents and incidents occurring from operations or work performed under the contract shall be reported, verified, investigated, and analyzed as prescribed by the Port of Seattle Construction Safety & Health Manual. Contractors and other individuals involved in the work shall instruct employees and other personnel to follow these procedures if someone is injured.
 - a) Seek medical assistance for anyone injured. The injured person's supervisor will see that first-aid is administered.
 - b) When a serious accident or emergency occurs/exists, secure the incident area tightly and quickly except for rescue and emergency personnel.
 - c) Send individuals as required, to assist or direct any emergency personnel arriving on the site.
 - d) The accident scene shall not be disturbed until released by the Incident Command or Manager of Construction Safety Services, except for circumstances where "Imminent Danger" exists to those performing any emergency services.
 - e) Immediately notify the Engineer and Manager of Construction Safety Services (or designee) regarding any accident or injury requiring more than First Aid treatment, any third-party incident, or any equipment or property damage estimate in excess of \$1,000. Notify the Manager of Construction Safety Services of all other incidents including near miss incidents as soon as possible following the event.
 - f) Washington State Department of Labor and Industries must be notified immediately by the Contractor in the event of an accident involving the death or hospital admission of any employee.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- g) Employees must report all injuries or occupational-related illnesses as soon as possible to their employer or immediate supervisor.
- h) A detailed written report, identifying causes and recommending corrective action, must be submitted to the Engineer and Manager, Construction Safety Services within 24 hours. No supervisor may decline to accept a report of an injury from a subordinate.
- i) Within 48-hours of a Recordable or Lost Work Day Case Injury, incident involving 3rd party, or property damage incident, the Contractor shall meet with the Engineer and Manager of Construction Safety Services. The meeting shall discuss the status of the injured employee, the root cause of the incident, corrective action implemented, the Job Hazard Analysis, and retraining of the employee and supervisor.
- j) Report all accident exposures and near miss incidents that occur on the job site. These records are to be maintained and submitted to the Engineer or other designated authority upon request and shall include but not be limited to:
 - 1) First-aid injuries not reported on the OSHA No. 300 Form.
 - 2) The Contractor's OSHA 300 Form.
- k) The above information shall be provided only to authorized personnel including the Engineer and Manager of Construction Safety Services.
- l) All questions from the media regarding any incident occurring on site shall be referred to the Port's Public Affairs Manager via the Engineer.

End of Document

APPENDIX A

Sample Contractor's Safety Plan

The Contractor is responsible for reviewing the requirements found and referenced in this Document, the Contract, the Port of Seattle Construction Safety & Health Manual as a minimum, and incorporating any additional specific or unique safety requirements into their written plan. The Contractor's Safety Plan shall include but not be limited to the following guidelines:

A. GENERAL PROVISIONS

1. **Compliance:** Provisions for accident investigations and reporting, formal incident review, reporting, corrective action and disciplinary action procedures meeting the minimum Port of Seattle requirements.
2. **Job Hazard Analysis (JHA):** The Contractor shall complete detailed, written Job Hazard Analysis for the work to be performed, identifying hazards that may exist or be created, outline the equipment to be used, and what procedures and/or safety equipment will be used to eliminate or reduce those hazards. The Contractor shall use the form provided in the Port of Seattle's Construction Safety & Health Manual or contractor equivalent. Supplemental Daily Pre-Task Plans are strongly encouraged.
3. **Medical Treatment:** Provide medical treatment in compliance with Federal, State and local requirements. Names of individuals CPR and First Aid trained.
4. **Site Specific Emergency Procedures:** As related to injuries, weather or emergencies at an active POS facility including pre-determined sites for assembly and measures for accounting of employees shall be included. Emergency numbers shall be posted at the given work area(s):

Fire or Ambulance from a non-Port hard-line phone	911
Fire or Police from a Port hard-line phone	9911
Fire or Police Emergency (Airport)	(206) 787-5380
Fire (Seaport)	911
Police (Seaport)	(206) 787-5380
5. **DOSH/OSHA Requirements and Personal Protection:** Safety and health provisions for providing adequate lighting, ventilation, hearing conservation, CO monitoring, and housekeeping. A written Personal Protective Equipment Assessment for head, face, eye, hand and torso protection shall be included.
6. **Personnel Instruction:** The Contractor must identify the greatest number of employees to be working at any one time during peak construction periods, the company policies for initial safety indoctrination of all employees, and company plans for continued safety education for all employees, including: weekly safety meetings, POS Safety Orientation,

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Ergonomics, Asbestos Awareness training, and English as a second language.

7. **Responsibilities:** Acknowledgment that the Contractor is totally responsible for compliance with OSHA, DOSH, Port or other applicable rules and orders. Additionally, the plan will require a place of employment that is free of unsanitary or hazardous conditions that would harm an employee's health or safety.
8. **Safety Inspections:** Detailed information concerning how safety inspections will be conducted, their frequency, and their documentation.
9. **Safety Personnel:** State the name of the Contractor's Safety Representative(s), their experience and qualifications (i.e. Training in the OSHA 500 (or equivalent), 30-hour or 10-hour) Indicate their authority to take the appropriate measures to eliminate hazards or stop work until hazardous conditions are corrected.
10. **Safety Requirements, Electrical:** Testing, inspection and repair of electrical equipment, GFCI Program, lockout/tagout procedures, how existing circuits will be located and the installation of electrical circuits in accordance with the National Electric Code or Port Mandated Requirements.
11. **Safety Requirements, Equipment:** Operation, documented daily inspection, and maintenance for trucks and heavy equipment such as backhoes, dozers, motor graders, elevated work platforms, powered industrial trucks, and all hand and power tools.
12. **Safety Requirements, Ladders:** Types of ladders for specific uses and their training requirements.
13. **Site Layout:** A layout drawing of the site indicating access roads, fire and ambulance lanes, location of first aid stations, location of required alarm systems, location of offices, parking for private vehicles and equipment, and storage of all flammable and/or combustible liquids, gases, or other hazardous materials.
14. **Storage:** Requirements for storage of flammable and combustible liquids or gases.
15. **Field Sanitation:** Provisions for toilet and hand washing facilities, including the frequency at which they will be cleaned and maintained.

B. SPECIAL PROVISIONS

Depending on the type of construction, additional items must be incorporated into the Contractor's Safety Plan.

1. **Confined Space Entry:** Procedures for confined space entry and work operations in and around confined spaces (including elevator shafts) as well as emergency measures. These procedures must meet or exceed the Port of Seattle requirements found in the Port of Seattle Construction Safety & Health Manual. Prior to daily entry, prime/general contractor shall be notified.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

- a) **Airport:** . When entry is to be made into a Permit Required Confined Space the Port of Seattle Fire Department Emergency Dispatch shall be contacted prior to entry and at completion of shift.
2. **Steel Erection:** These requirements shall meet or exceed the guidelines of Chapter 296-155 WAC Part P, and shall include: pre-planning, hoisting operations, fall protection procedures, overhead protection and Site-Specific Erection Plan.
3. **Cranes:** Use of cranes or derricks and the testing and inspection thereof, including hooks, latches, wire rope, operator certification, boom stops, load charts, wind speed, warning devices, fire extinguishers, crane operation signals, suspended work platform pre-lift planning, and critical lift plans.
4. **Excavations:** Excavation plans must indicate sloping, documented daily inspections, shoring, barricading, excavation access, *fall protection*, and excavated material storage.
5. **Fall Protection:** How 100% protection will be maintained, identify the use of personal fall arrest equipment, fall protection systems, and fall protection work plans for heights 4-feet. NOTE: The *Monitor System is prohibited*.
6. **Formwork:** Submittal of formwork and false work drawings for review and approval to the Engineer.
7. **Hazard Communication Program:** Including MSDS, their location, Master List of Chemicals, Personal Protective Equipment, Training, Labeling, and MSDS review and special procedures for sealers, coatings or specialty paints.
8. **Interruption of Fire/Security Systems:** Plans shall include measures and/or procedures to provide interim fire and security protection to facilities or areas affected by interruptions. These include automatic detection devices and alarms, automatic sprinkler systems, fire pumps, fire hydrants, applicable water supplies and reservoirs.
9. **Lock-out/Tag-out:** Procedures for lock-out/tag-out of energy sources during work operations. The Contractor shall include as part of the Lock-out/Tag-out program protocol for *Clearance Orders and Switching Orders* on electrical and mechanical systems.
10. **Scaffolding:** Red/Yellow/Green "Use" tag system, planking, guardrails, toe boards, anchor points, fall protection, access points, and inspections of.
11. **Fire Protection:** Including Hot Work Permits, Welding, shields, fire extinguishers, ventilation, PPE, fire watch and cylinder storage.
12. **Work Adjacent To Occupied Spaces:** Procedures for ensuring occupants of spaces adjoining, above and below construction areas will be protected from hazards created by construction, including but not limited to, falling debris, equipment noise, and penetration of partitions, ceilings, and floors.
13. **Competent Persons:** Where regulatory requirements (DOSH) specify the use of Competent Persons, the Contractor shall submit in writing the names of those persons. Their area of competency and applicable experience/training documentation.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

14. **Energized Electrical Work Plan:** Submit detailed procedures for working on and guarding of energized equipment or conducting system outages.
15. **Seaport Safety:** Contractors shall submit a safety plan complying with all Federal, State, Corp of Engineers, Port of Seattle, and Coast Guard rules applicable to this type of construction.
16. **Health Considerations:** The Contractor shall submit a plan that addresses safety & health procedures for working in contact with contaminated soils. This plan shall be revised and resubmitted in the event that conditions encountered during the work are different than those initially planned for. It shall also include:
 - a) Identification and evaluation of the hazards and risks associated with each work task.
 - b) The names and qualifications of each contractor's representative(s) in charge of the work and present at the project when pipeline removal is performed.
 - c) Identification of supervisory personnel and alternative responsibilities for site safety/response operations.
 - d) Determine levels of personnel protection to be worn for various site operations.
 - e) List equipment with adequate nomenclature by item that will be used at the job site and the date and location where the Engineer can inspect this equipment.
 - f) Establishment of emergency procedures, such as: escape routes, fire protection, signals for withdrawing work parties from the site, emergency communications, wind indicators, including facility notification.
 - g) Identification and arrangements with the nearest medical facility for emergency medical care of both routine-type injuries and toxicological problems. Submit the name, location, and telephone number of this facility.
17. **Conveyor Safety Policy:** To include procedures for deactivation of conveyor systems, lockout/tagout of systems, working around operating conveyors and required Port of Seattle conveyor safety training.
18. **STS Tunnel Access Procedures:** What procedures employees will follow if work requires access into the STS system.
19. **Demolition:** The Contractor shall submit a plan to include how they will safely demolish existing structures, ensure security, safe guard employees and the public from falling material, electrical hazards and air quality issues. An Engineering Survey performed and signed by a Qualified Person shall be included.
20. **Public Protection Plan:** The actions the Contractor will take to protect the public while performing construction or demolition on the project. The plan shall include, but not be limited to, barricades, fencing, and signage.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management


"Public" is defined as anyone not associated with the project - general public, POS and tenant employees.

C. SITE SPECIFIC SAFETY PLAN WORKSHEET

1. The following worksheet is to be used for Port Construction Services On Call Contracts for each work authorization. Once a safety submittal has been made and accepted for the On Call contract, Contractor will submit for each work authorization the following worksheet including support documentation referenced within the worksheet prior to beginning work.

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

	JOB HAZARD ANALYSIS WORKSHEET			Site Specific Plan Addendum		
				Person in Charge* for Reporting Hazards and Injuries:		
Location/address:					Phone Number:	
Title of Job/Operation:		Date:		* requires OSHA 10 & complete documented daily inspections		
				Day of Safety Meetings:		
		Work Order #:		Emergency action plan	Call Fire Dept 787-5380 on airport grounds. 911 everywhere else. For large scale emergency meet at:	
Analysis Made By:		Contact person:				
Analysis Reviewed By:		Phone Number:				
Location of Master Prevention Program:						
Sequence of Basic Job Steps	Potential Hazards/Ergonomics		Recommended Safe Job Procedures and Required PPE			
Supervisor Signature:			Received by RE/CM:			

DIVISION 1 – GENERAL REQUIREMENTS

Section 01860 - Safety Management

Will the Scope of Work consist of the following tasks? (check all that apply)		^(a) List Chemicals to be used on the project. Material Safety Data Sheets attached <input type="checkbox"/> Yes <input type="checkbox"/> No *Physical MSDS must be on-site.	
Traffic control*	Confined Space Entry*		
Welding, Cutting, Grinding*	Heavy Equipment		
Trenching or Excavation*	Flammable or Combustible materials ^(a)		
Carpentry	Steel Erection*		
Painting, Staining, Sealant ^{*(a)}	Ladder or Scaffold work		
Demolition (Structural)*	Roofing		
Energized Electrical*	Regulated Materials		
Use of a Crane/Boom/Hoisting device*	Hazardous Materials		
Work from heights of 6' or greater*	Conveyors*		
* Requires additional paperwork – checklists, plans, permits, shut-down notice, etc.		^(*) A Chemical Exposure Plan will be required for products containing isocyanates, methylene chloride, Hydrofluoric Acid, lead, silica and processes involving floor sealers, traffic coatings, terrazzo sealers or specialty paints.	

Description of public protection measures ("Public" is defined as anyone not associated with the project - general public, POS, Tenant, and Airline Employees):

Employee Disciplinary for non-compliance with set forth safety policies and procedures will be consistent Port of Seattle's disciplinary action matrix as described within your site-specific safety plan and site-specific orientation.

Sign Up			
Print Name	Signature	Print Name	Signature

APPENDIX B

CONTRACTOR CONFINED SPACE ENTRY PROGRAM CERTIFICATE

I hereby certify that the attached Confined Space Entry Program meets or exceeds the requirements of DOSH standards WAC 296-809 and the Port Of Seattle's Confined Space Entry Program.

My employees will utilize the Port of Seattle (POS) confined space entry permit(s). They will complete all other sections of the permit that are appropriate for the confined space being entered.

My employees will be informed that they must coordinate their confined space entry procedures with other Contractors and POS employees working in or around the confined space. On Airport projects, if entering into a Permit Required Confined Space, we will first contact the Port of Seattle Fire Department, notifying them of the specific location and activity to be performed.

My employees, who will be acting as authorized entrants, attendants, entry supervisors, and air testers, have been trained in accordance with the DOSH procedures and will be made aware of all of the POS procedures for entering confined spaces.

After the confined space entry project is complete my employees will make the Engineer and Construction Safety aware of any new hazards confronted or created during entry operations. On Airport projects, my employees will contact the Port of Seattle Fire Department and advise them that operations have ceased.

A copy of finalized permit with all attachments will be provided to the Engineer at the end of each project.

Contractor's Name: _____

Contractor's Signature: _____

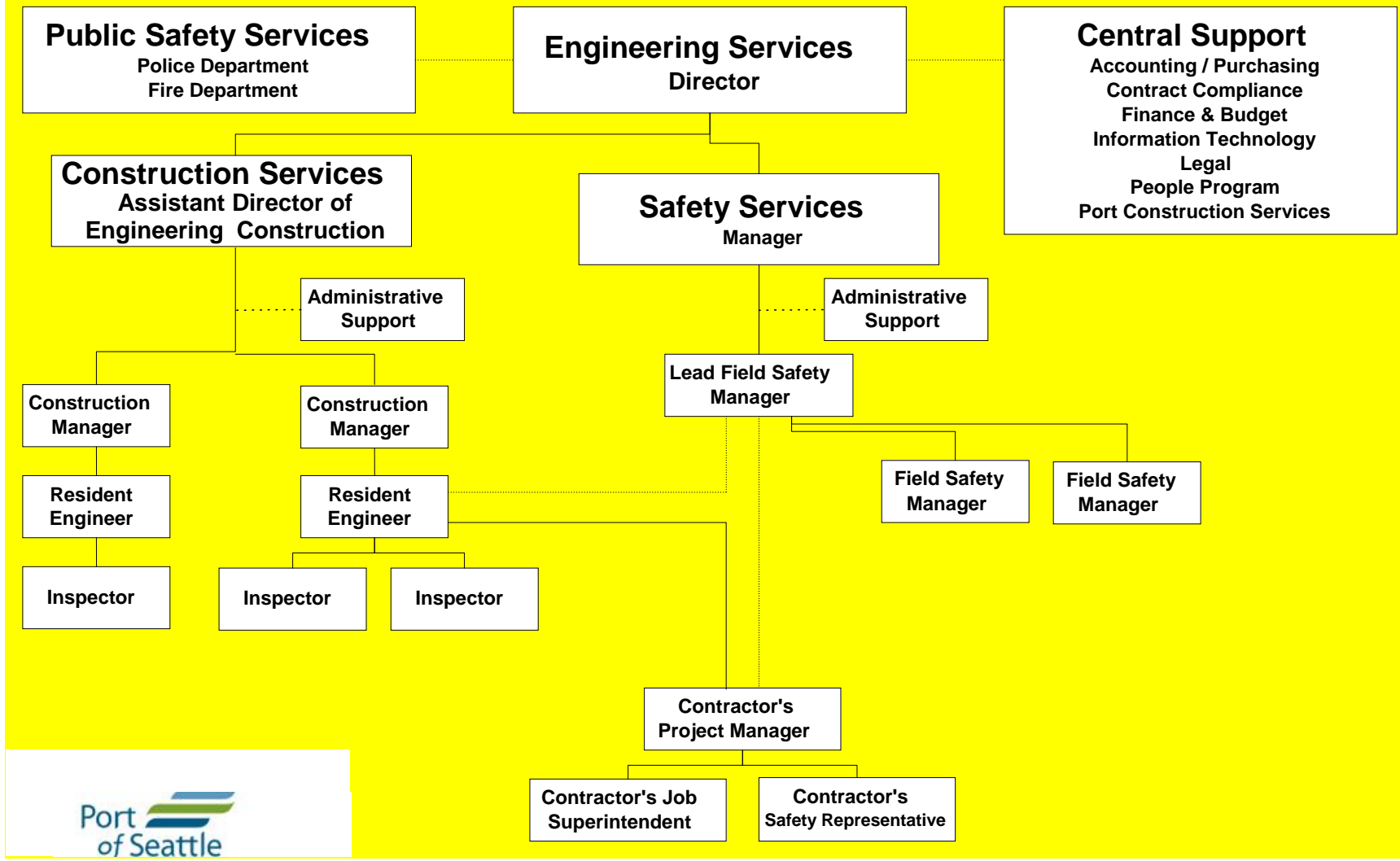
Company Name: _____ Date: _____

Port of Seattle Resident Engineer: _____

Date: _____

Appendix C

Construction Safety Program Organization Chart



APPENDIX D

Construction Safety Inspection Report

Contractor:
Contract#:
Project Name:
Accompanied by:
Date:

ITEM	SAFETY VIOLATION	REFERENCE	CONTRACTOR'S CORRECTIVE ACTION

Report Prepared By:	Contractor Project Manager:
Title:	Signature:
Date:	Date:

All recommendations shall be abated in accordance with the contract and the report signed and returned within 5 days.

Copies to: Manager, Construction Safety Services
01860 Safety Management Specification
Rev: 06/06/11

DIVISION 2 - SITE WORK Section 02220 - Site Demolition

PART 6 GENERAL 6.01 SUMMARY

- A. Extent of Work: The extent and location of the “Demolition” work is indicated on the drawings. The work includes the requirements for the removal, wholly or in part and satisfactory disposal of all buildings, utilities, fences, pavements, curbs, structures, light fixtures, or within these specifications. The Demolition work is included on conduits, wires and other obstructions which are designated to be demolished on the drawings the drawings for guidance only and to indicate typical general construction features of the various types of structures and is not to be construed as definitive or adequate to supplant the actual on-site inspection by the Contractor.
- B. Related Documents: The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements, apply to this work as if specified in this section.
- C. Related Work Specified Elsewhere:
 - 1. Section 01140 - Operational Safety on Airports During Construction
 - 2. Section 01552 - Haul Routes
 - 3. Section 02331 - Clearing, Grubbing and Cleanup
 - 4. Section 02300 - Earthwork
 - 5. Division 15 - Mechanical
 - 6. Division 16 - Electrical
- D. All, or a portion of, the work covered by this Section is to be conducted within the Air Operations Area (AOA) at Sea-Tac International Airport. Restrictions and conditions necessary to maintain airfield and aircraft safety as required by FAA regulations and as required to maintain efficient airport operations, may impose limitations upon the Contractor’s methods and procedures. Section 01140 - Operational Safety on Airports During Construction, lists the applicable conditions, limitations and regulations.

6.02 JOB CONDITIONS

- A. The Contractor represents that it has visited the site to become familiar with the quantity and character of all materials to be demolished. The Contractor agrees that the premises were made available prior to deadline for submission of bids for whatever inspection and tests the Contractor deemed appropriate.

6.03 DEMOLITION PLAN

- A. The Contractor shall submit to the Port of Seattle a demolition plan that at a minimum addresses the following:
 - 1. Worker safety.
 - 2. Protection of the public.
 - 3. Protection of workers or other persons in floors below, areas surrounding, and demolition site.

4. Work sequence.
5. Means and methods to minimize waste and maximum salvage.
6. Disposal procedures.
7. Protection of the environment.
8. Disposal site(s) approved by the Port and all environmental agencies, including permits and permissions as necessary.

PART 7 PRODUCTS

7.01 GENERAL

- A. Products that are required to accomplish, or to be incorporated into, the work of this section shall be as selected by the Contractor, subject to the approval of the Engineer.

7.02 SALVAGE ITEMS

- A. Steel or wooden structures, utilities, or equipment to be salvaged for the Port of Seattle shall be carefully dismantled without unnecessary damage. [Steel] [Wood] [Stone] members shall be match-marked.
- B. All material designated to be salvaged for the Port of Seattle shall be delivered and stored as specified in the salvage list:
 1. Salvage List: To be stored at:
 - a. [] []
 - b. [] []
 - c. [] []
 2. Salvage List: To be delivered to:
 - a. [] []
 - b. [] []
 - c. [] []

7.03 DEMOLITION ITEMS

- A. Structures to be demolished:
 1. []
 2. []
 3. []
- B. Utilities to be demolished:
 1. []
 2. []
 3. []
- C. Improvements to be demolished:
 1. []

2. []
3. []

PART 8 EXECUTION

8.01 DEMOLITION OF STRUCTURES

- A. Completely remove and dispose of designated buildings, foundations, structures, fences and other obstructions. All pavements, sidewalks and curbs designated for removal shall be broken up, loaded and disposed of by the Contractor. Care shall be taken in removing the pavement, so that damage does not occur to the existing pavement which is to remain in place and that all removals are accomplished by making a neat vertical saw cut at the boundaries of the area to be removed. Adjacent materials designated to remain that are damaged by the Contractor due to his operations shall be replaced at no additional cost to the Port.
- B. Blasting or other special operations necessary for the removal of an existing structure or obstruction shall be subject to the approval of the Engineer.
- C. Unless otherwise noted on the plans, the Contractor shall have the following options for removing piling and bulkhead. Option 2 below, requires the Contractor to verify new pile locations to avoid conflicts.
 1. Pulling piling.
 2. Breaking off piling at the mud line.

8.02 DEMOLITION OF UTILITIES

- A. Well in advance of the demolition of any utilities, the Contractor shall advise the appropriate agency of the impending action and arrange with each utility, [Seattle City Light], [METRO], [Puget Sound Energy], [telephone company], for all work required by that utility under this contract. Special conditions required by the utility shall be the sole responsibility of the Contractor. Contact the utilities for bond requirements, if any, prior to bid.
 1. Piping: Remove all piping in the demolition area, including underground piping, exposed piping, or piping fixed to timber structures.
 2. Electrical and Telephone Items: Remove electrical conduit, fixtures and equipment from the demolition area.
 3. Water Lines: Remove and cap water and other utility lines in accordance with applicable codes.
 4. Storm Drains: Remove catch basins in the demolition area, including outfall piping through the bulkhead. Remove city outfall structures and trim pipe to clear new construction.

8.03 DISPOSAL

- A. General: All materials, except those indicated as Port of Seattle salvage, and except those materials containing substances classified as hazardous or potentially hazardous by local, state or Federal regulating

agencies, shall upon their demolition become the property of the Contractor. All such material, including those containing hazardous or potentially hazardous substances shall be removed and promptly disposed of away from the site and on property not owned by the Port of Seattle, except as otherwise provided in these specifications. No material shall be disposed of in adjoining waterways or in the fill. Burning of materials in these areas falls under the jurisdiction of the King County regulations and is generally forbidden under all circumstances.

- B. Cleanup: After removal of structures, buildings and foundations, clean and grade the area. There shall be no debris, rubble, or litter left at the site from any of the demolition operations and the site shall be clean.
- C. The Port of Seattle encourages the salvage and recycling of materials from demolished structures. The Contractor shall salvage or recycle, in an acceptable manner to environmental agencies and the Port of Seattle, at his option any of the materials designated for disposal.
- D. Non-salvageable or non-recyclable demolition, contaminated soils and creosote debris shall be transported to a Port approved lined landfill with a Lechate Collection System and shall be subject to the City of Seattle's material transfer tax.
- E. The Contractor shall submit to the Port of Seattle, proposed landfills and recyclers.

- 1. The following facilities are approved by the Port:

Demolition Debris and Creosote Disposal	Roosevelt Regional Landfill Roosevelt, WA
Demolition Debris and Creosote Disposal	Oregon Waste Systems Arlington, OR
Demolition Debris and Creosote Disposal	Finley Buttes Regional Landfill Boardman, OR
Asphalt & Concrete	Stoneway Rock Renton, WA
Asphalt & Concrete	R. W. Rhine, Inc. Tacoma, WA
Asphalt & Concrete	Renton Concrete Recyclers Renton, WA
Asphalt & Concrete	Woodworth & Company Tacoma, WA
Recycling of Creosote	R. W. Rhine, Inc.

Treated Timbers	Tacoma, WA
Recycling of All Treated Wood	All Wood Recycling Redmond, WA

2. The Contractor has the option to secure its own demolition debris, asphalt, concrete and creosote materials disposal or recycle site(s) provided it has acquired all permits and approvals necessary from governing agencies and the Port of Seattle.
- F. The Contractor shall submit to the Port of Seattle copies of trip tickets and receiver tickets for all material transported to approved landfills and/or recyclers.

DIVISION 2 - SITE WORK

Section 02270 - Temporary Erosion and Sediment Control Planning and Execution

PART 9 GENERAL

9.01 SUMMARY

- A. This item shall consist of planning, installing, inspecting, maintaining, upgrading and removing temporary erosion and sediment control Best Management Practices (BMPs) as shown on the drawings, in the Contractor's Erosion and Sediment Control Plan (CESCP), or as ordered by the Engineer to prevent pollution of air and water, and control, respond to, and manage eroded sediment and turbid water during the life of the contract.
- B. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions, and General Requirements, apply to this work as if specified in this section.
- C. This work shall apply to all areas associated with contract work including, but not limited to the following:
 1. Work areas
 2. Equipment and material storage areas
 3. Staging areas
 4. Stockpiles
 5. Access Roads

9.02 DESCRIPTION OF WORK

- A. In order to comply with the requirements of this section, the Contractor shall:

1. Develop and submit a Contractor's Erosion and Sediment Control Plan (CESCP). The CESCP shall, at a minimum, include and address the following:
 - a. Site Description and Drawings
 - b. Contractor Erosion and Sediment Control Personnel
 - c. Schedule and Sequencing
 - d. BMP Installation
 - e. BMP Maintenance
 - f. BMP Inspection
 - g. Record keeping
 - h. BMP Removal
 - i. Emergency Response
 - j. Construction Dewatering
 - k. Fugitive Dust Planning
 - l. Utilities Planning
 - m. Education
2. Revise and modify the CESCP during the life of the contract and maintain records.
3. Install, maintain, and upgrade all erosion prevention, containment, and countermeasures BMPs during the life of the contract, and removal at the end of the project.
4. Contain, cleanup and dispose of all sediment and convey turbid water to existing or proposed detention/treatment facilities.
5. Perform other work shown on the project drawings, in the Contractor Erosion and Sediment Control Plan, or as directed by the Engineer.
6. Inspect to verify compliance with the CESCP requirements including BMPs; facilitate, participate in, and implement directed corrective actions resulting from inspections conducted by others including outside Agencies and Port employees/consultants.
7. Educate all Contractor and sub-contractor staff in environmental compliance issues at weekly meetings and document attendance and content.

9.03 SUBMITTALS

- A. As part of the required Preconstruction Submittals, Section 01305 - Preconstruction Submittals and before NOTICE TO PROCEED is given, the Contractor shall submit the following:
 1. Contractor Erosion and Sediment Control Plan (CESCP)

B. The following shall be submitted in accordance with Section 01330 – Submittals:

1. Oil Absorbent Pads
2. Silt Fence
3. Straw Wattle
4. Erosion Control Matting
5. Bonded Fiber Matrix
6. Catch Basin Protection
7. Temporary Piping
8. CESCL Certification Cards
9. CESCL Qualifications

9.04 DEFINITION

- A. SWPPP: Stormwater Pollution Prevention Plan consisting of the following documents:
1. Temporary Erosion and Sediment Control Plan sheets in the contract documents;
 2. Section 02270 - Temporary Erosion and Sediment Control Planning and Execution;
 3. Section 01631 - Pollution Prevention Planning and Execution;
 4. Contractor's Erosion and Sediment Control Plan (CESCP), both submitted by the Contractor.
 5. Construction Storm Water Monitoring Plan developed by the Port.
- B. BMP: Best Management Practice
- C. NPDES: National Pollutant Discharge Elimination System
- D. CESCP: Contractor's Erosion and Sediment Control Plan
- E. IWS: Industrial Waste System Airport construction only
- F. STIA: Sea-Tac International Airport Airport construction only

9.05 REFERENCES

- A. The following rules, requirements and regulations specified may apply to this work:
1. Sea-Tac International Airport Rules and Regulations (current edition)
 2. Port of Seattle Regulations for Airport Construction (current edition)

3. National Pollution Discharge Elimination System Waste Discharge Permit No. WA-002465-1
4. Stormwater Pollution Prevention Plan, as required by the NPDES Permit No. WA-002465-1.
5. Section 401 Water Quality Certification
6. Hydraulic Project Approval Permit (HPA)
7. Puget Sound Storm water Management Plan, Puget Sound Water Quality Action Team; 1998
8. WAC 173-201 A, Water Quality Standards of the State of Washington
9. Surface Water Design Manual, King County, Department of Natural Resources, (Current Edition)
10. Storm water Management Manual for Western Washington, Department of Ecology (Current Edition).

9.06 PERMITS

- A. Work shall be conducted in accordance with NPDES permit No. WA- 0024565-1.
- B. Work shall be conducted in accordance with Stormwater Pollution Prevention Plan, as required by the NPDES permit No. WA-002465-1. For Seaport Construction provide permit number if applicable.

9.07 ADMINISTRATIVE REQUIREMENTS

- A. The provisions of this section shall apply to the Contractor, subcontractors at all tiers, suppliers and all others who may have access to the work site by way of the contractor's activities.
- B. Failure to install, maintain, and/or remove BMPs shown on the drawings, in the approved Contractor Erosion and Sediment Control Plan and specified herein, or by order of the Engineer; or failure to conduct project operations in accordance with Section 02270 - Temporary Erosion and Sediment Control Planning and Execution will result in the suspension of the Contractor's operations by the Engineer in accordance with Section 00700 - General Conditions, paragraph G-10.04.
- C. The Contractor shall be solely responsible for any damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this section.
- D. Any damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this section will be deducted from payment due by Modification.

- E. Any time and material costs incurred by the Port due to damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this section will be deducted from payment due by Modification.
- F. The Contractor shall be solely responsible for any schedule impacts from damages, fines, levies, judgments, or stop work orders incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this section. The project schedule will not be changed to accommodate the time lost.
- G. Contractor shall not clear, grub, grade, demolish, or perform any earthwork after NOTICE TO PROCEED until the following has been installed per the project drawings, the approved Contractor Erosion and Sediment Control Plan, or as directed by the Engineer:
 - 1. Silt Fence or other perimeter controls are in place.
 - 2. Areas not to be disturbed are delineated with safety fence.
 - 3. Temporary ponds and ditches are installed and vegetated or covered.
 - 4. Permanent ponds used for sediment control during construction have been installed and vegetated or covered and modified with riser.
 - 5. Water flows from off site are tight lined and directed away from work area.
 - 6. All construction entrances are stabilized and tire wash systems in place and operational.
 - 7. Catch basin inserts are installed in all catch basins that receive drainage from the Work area and haul routes within the STIA NPDES boundaries.
 - 8. Stormwater storage tanks are located onsite to provide for additional storage volume and/or treatment volume required for treatment by settlement.
 - 9. Materials on hand, in quantities sufficient to cover all bare soil, divert all flows, contain all sediments, and prevent turbid discharges from the site during all stages of construction. These materials include, but are not limited to the following:
 - a. Reinforced 6 mil plastic sheeting
 - b. Straw bales
 - c. 6" pipe
 - d. 8" pipe
 - e. Sand bags, filled
 - f. Wire-backed silt fence
 - g. Steel "T" posts

9.08 AUTHORITY OF ENGINEER

- A. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing, excavation, and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, wetlands or other areas of water impoundment.
- B. In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or are ordered by the Engineer, such work shall be performed by the Contractor at his/her own expense.
- C. The Engineer may increase or decrease the area of erodible earth material to be exposed at one time as determined by analysis of project conditions.
- D. In the event that areas adjacent to the work area are suffering degradation due to erosion, sediment deposit, water flows, or other causes, the Engineer may stop construction activities until the situation is rectified.
- E. In the event that the Washington State Department of Ecology issues an Inspection Report, a Notice of Non-Compliance, Notice of Violation or Enforcement Action, the Engineer may stop all construction activities until it has been determined that the project is in compliance. The Engineer may require the Contractor to send additional staff to successfully complete Contractor Erosion and Sediment Control Lead (CESCL) training before construction activities may begin. The number of working days will not be changed to accommodate the work stoppage. All costs associated with work stoppages, mitigation of the event, and/or training shall be paid by the Contractor.
- F. In the event that the Contractor discharges storm water, ground water, or process water to storm drains, ditches, gutters or any conveyance that discharges to a receiving water as defined by the Department of Ecology without prior approval of the Engineer, the Engineer may stop all construction activities and require additional Contractor staff training and may require that all parties involved in the unapproved discharge be removed from the project for a time determined by the Engineer. The project schedule will not be changed to accommodate the time lost. All costs associated with mitigation of the unauthorized discharge, work stoppages, training and/or removal of personnel from the project shall be paid by the Contractor.

9.09 COORDINATION MEETINGS

- A. The Contractor shall be available, at a minimum, for a weekly coordination meeting with the Engineer, other Port Staff and outside agency representatives to review the ongoing contract work for compliance with the provision of this specification.

PART 10 PRODUCTS

10.01 GENERAL:

- A. All products used to construct the Contractor selected BMPs shall be suitable for such use and submitted to the Engineer for approval.

10.02 OIL ABSORBENT PADS:

- A. Oil absorbent pads shall be made of white, 100 % polypropylene fabric that absorbs oil-based fluids and repels water-based fluids. Each pad shall be a minimum of 15x19 inches in size and absorb no less than 50 ounces of oil-based fluids.

10.03 TESC – ASPHALT CURB & ASPHALT BERM:

- A. Asphalt curb and asphalt berm shall be constructed as directed by the Engineer. The asphalt concrete shall meet the requirements of Section 02743 – Asphalt Concrete Pavement.

10.04 SILT FENCE:

- A. Geotextile material shall meet the requirements of WSDOT Specification Section 9-33 Table 6. Geotextile material shall be backed by 2"x4" wire mesh and shall be attached to steel "T" posts using wire or zip ties. Dimensions and spacing shall be as detailed on the drawings.

10.05 STRAW WATTLE:

- A. Wattles shall consist of cylinders of biodegradable plant material, such as straw, coir, or compost encased within biodegradable or photodegradable netting. Wattles shall be a minimum of 5 inches in diameter, unless otherwise specified. Encasing material shall be clean, evenly woven, and free of debris or any contaminating material, such as preservative and free of cuts, tears or damage. Compost filler shall meet material requirements specified in WSDOT Section 9-14.4(8) Coarse Compost. Straw filler shall be 100% free of weed seeds.

10.06 EROSION CONTROL BLANKET:

- A. Erosion Control Blanket shall meet the requirements of WSDOT Specification Section 9-14, paragraph 9-14.5(2) "Erosion Control Blanket". Installation in ditches and swales shall be per WSDOT Standard Plan I-60.20-00 "Erosion Control Blanket Placement in Channel". Installation on slopes shall be per WSDOT Standard Plan I-60.10-00 "Erosion Control Blanket Placement on Slope".

10.07 BONDED FIBER MATRIX SOIL STABILIZATION:

- A. Bonded Fiber Matrix soil stabilization shall be labeled as such on the unopened bags furnished by the manufacturer. Bonded fiber matrix shall be installed with seed and fertilizer included in the homogenous mix. Seeding shall be as specified in Section 02992 – Hydroseeding for Erosion Control and Landscaping.

10.08 CATCH BASIN PROTECTION:

- A. Catch basin protection shall be designed and installed for the purpose of preventing sediment from entering the storm system. Protection shall:
 - 1) Be constructed of non-woven geotextile fabric with sewn seams;

- 2) Contain a built-in lifting strap;
- 3) Have a built-in, high flow bypass;
- 4) Be sized such that all water draining to the catch basin flows into the insert and does not flow directly into the storm.

B. Catch basin covers shall be 30 mil PVC liner material.

10.09 TEMPORARY PIPING/CONNECTIONS:

- A. Temporary piping shall meet the requirements of the storm drain pipe as specified in Section 02610 – Pipe for Drains and Culverts. Temporary catch basin shall meet the requirements of Section 02633 – Manholes, Catch Basins, and Utility Structures.

10.10 TEMPORARY PIPING PLUGS:

- A. Installation in Pipe/Structure to be Demolished/Abandoned. Plug shall be concrete as specified in Section 03300 – Cast-in-Place Concrete.
- B. Installation in Pipe/Structure to Remain. Plug shall be a mechanical secured plug.

10.11 STORMWATER STORAGE TANK:

- A. The tank shall be a fixed axle weir tank with a minimum 21,000 gallon.

10.12 STORMWATER STORAGE TANK PADS:

- A. The stormwater storage tank pads shall be as detailed on the drawings.

10.13 CONSTRUCTION LIMITS FENCING:

- A. Fencing material shall be standard size orange plastic mesh construction safety fence. Posts shall be steel “T” posts.

10.14 ROCK CHECK DAMS:

- A. Rock check dams shall be constructed of quarry spalls per the details shown in the project drawings and as specified in Section 02330 - Excavation and Embankment.

10.15 STABILIZED CONSTRUCTION ENTRANCE

- A. Stabilized construction shall be constructed of stabilization geotextile fabric and quarry spalls as specified in Section 02330 – Excavation and Embankment.

10.16 WHEEL WASH

- A. The wheel wash shall be a high water pressure, low water volume system long enough to allow for at least two full tire rotations. Spray nozzles shall be directed at inner and outer side walls for all tires including duals, all treads from two directions, wheel wells and flaps, and truck sides up to the bottom of the windshield. For water line material and construction requirements shall be as specified in Section 02510 – Water Distribution.

10.17 GEOTEXTILE FABRIC CHECK DAMS

- A. Geotextile check dam shall be a urethane foam core encased on Geotextile material. The minimum length of the unit shall be 7 feet. The

foam core shall be a minimum of 8 inches in height, and have a minimum base width of 16 inches. The geotextile material shall overhang the foam by at least 6 inches at each end, and shall have apron type flaps that extend a minimum of 24 inches on each side of the foam core. The geotextile material shall meet the requirements for silt fence.

10.18 PLASTIC SHEETING

- A. Plastic sheeting shall be clear, reinforced, and a minimum of 6 mil thick. Sandbags or other Engineer-approved material shall be used to secure the plastic sheeting in place. Black plastic may be used to cover stockpiles.

10.19 TEMPORARY ORGANIC MULCH

- A. Temporary organic mulch shall consist of straw, wood chips, hog fuel, compost or other material approved by the Engineer.

PART 11 EXECUTION

11.01 GENERAL

- A. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.
- B. No discharge of water shall be allowed that increases volume, velocity, or peak flow rate of receiving water background conditions, or that does not meet state of Washington water quality standards.
- C. The Contractor's Erosion and Sediment Control Plan (CESCP) required by this section shall be based upon the Temporary Erosion and Sediment Control (TESC) requirements of the contract but shall specifically phase, adjust, improve and incorporate the TESC requirements into the Contractor's specific schedule and plan for accomplishing the work. The CESCP shall be modified as changes are made to improve, upgrade and repair best management practices used by the Contractor and as the work progresses and TESC needs change.
- D. The Contractor shall be wholly responsible for control of water onto and exiting the construction site and/or staging areas, including groundwater, stormwater, and process water. Stormwater from offsite shall be intercepted and conveyed around or through the project and shall not be combined with onsite construction stormwater.
- E. Modifications to project hydraulic conveyances, detention facilities, and TESC plan sheets shall be stamped by a Professional Engineer (P.E.) licensed by the State of Washington. All other changes to the CESCP shall be signed by the CESCL.

11.02 CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN (CESCP)

The Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP). The contents of a construction SWPPP may vary with the amount of new or replaced impervious surface, acres of land disturbing activity and the classification of water. The SWPPP shall comply with the Director's Rules based

on the City of Seattle “Stormwater Code”, SMC Chapters 22.800 through 22.808. The “Stormwater Code” can be found at:

<http://www.seattle.gov/dpd/Codes/default.asp#construction>

In order to comply with these requirements, the Contractor shall include and address the following in the CЕСP:

A. Site Description and Drawings

1. Included in the CЕСP shall be a written description of the construction site, including location of staging areas, stockpile areas, material storage areas, natural and constructed drainage systems within the work area and staging areas, and proximity to other construction projects.
2. Drawings shall be included in the CЕСP which show the location of the construction site, including location of staging areas, stockpile areas, material storage areas, natural and constructed drainage systems within the work area and staging areas, and proximity to other construction projects.
3. The drawings shall show locations of BMPs during each phase of construction as identified by the Contractor in the Project Schedule.
4. The drawings and written description shall detail temporary stormwater conveyance facilities and other measures proposed by the Contractor to limit the contributing drainage areas to not exceed the capacity of each of the stormwater ponds.

B. Contractor Erosion and Sediment Control Personnel

1. The Contractor shall designate sufficient employees as the responsible representatives in charge of erosion and sedimentation control. These employees’ responsibility will be the oversight of all water and air quality issues. One of these designees shall be onsite at all times when any work activity is taking place.
2. One of the designated employees responsible for erosion and sedimentation control as discussed above shall be the Contractor Erosion and Sediment Control Lead (CESCL) who is responsible for developing, maintaining and modifying the CЕСP for the life of the Contract and ensuring compliance with all requirements of this section.
3. The CESCL shall be qualified in the preparation of erosion and sediment control plans, in the installation, inspection, monitoring, maintenance of BMP’s, and documentation required for NPDES permits as well as sensitive resource identification, water treatment, and restoration and stabilization of unstable slopes, shorelines, stream banks, and wetlands.
4. The CESCL shall have authority to direct all Contractor and sub-contractor personnel.

5. The CESCL shall have no other duties aside from developing, maintaining, modifying, inspecting, implementing the CЕСP and ensuring compliance with all requirements of this section, and, all other environmental regulations, or as directed by the Engineer.
6. Qualifications of the CESCL shall be as follows:
 - a. Have successfully completed Contractor Erosion and Sediment Control Lead (CESCL) training given by a Washington State Department of Ecology-approved provider, ,and have five years experience in construction site erosion and sediment control regulatory requirements and BMPs, erosion and sediment control plan development, and stormwater/water quality monitoring, or
 - b. Currently certified as a Certified Professional in Erosion and sediment Control (CPESC) offered by CPESC, Inc. (www.cpesc.org) and have one year experience in state of Washington construction site erosion and sediment control regulatory requirements and BMPs, erosion and sediment control plan development and stormwater monitoring.
7. The CESCL shall also have done the following:
 - a. Coordinated, developed, and implemented erosion and sediment control plans for NPDES permit compliance in the State of Washington.
 - b. Completed at least two erosion and sediment control plans for earthwork projects.
 - c. Developed phased construction work schedules addressing all ground disturbing activities.
 - d. Designed proper temporary and permanent erosion and sediment control measures (BMPs) during clearing, new road construction, existing road improvement, and for emergency situations.
 - e. Designed excavation dewatering plans.
 - f. Designed plans for dust abatement, embankment stabilization, and restoration
 - g. The Contractor shall submit for approval all documentation listed above necessary to prove CESCL qualifications including but not limited to resumes, certificates, degrees, recommendation letters, and plan examples.
8. Duties and responsibilities of the CESCL shall include:
 - a. Maintaining permit file on site at all times which includes the CЕСP, the SWPPP, and any associated permits and plans;
 - b. Directing BMP installation, inspection, maintenance, modification, and removal;

- c. Availability 24 hours per day, 7 days per week by telephone;
 - d. Updating all drawings with changes made to the plan;
 - e. Keeping daily logs;
 - f. Prepare and submit for approval a Contractor Erosion and Sediment Control Plan (CESCP);
 - g. Immediately notify the Engineer should any point be identified where storm water runoff potentially leaves the site, is collected in a surface water conveyance system (i.e., road ditch, storm sewer), and enters receiving waters of the State;
 - h. If water sheet flows from the site, identify the point at which it becomes concentrated in a collection system.
 - i. Inspect CESCP requirements including BMPs as required to ensure adequacy; facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies, Port employees, and Port consultants.
 - j. Set up and maintain a construction stormwater monitoring plan that includes monitoring locations and procedures. At a minimum, the plan will include monitoring points everywhere construction stormwater discharges from the project.
- 9. The CESCL shall have authority to act on behalf of the Contractor and shall be available, on call, 24 hours per day throughout the period of construction.
 - 10. The CESCP shall include the name, office and mobile telephone numbers, fax number, and address of the designated CESCL and all Contractor personnel responsible for erosion and sediment control.
 - 11. In addition to the CESCL, the Contractor shall designate sufficient employees as Erosion and Sediment Control Inspectors who will be responsible for all erosion and sediment control, water quality, fugitive dust and other environmental compliance as directed by the CESCL. At a minimum, the Contractor's superintendent foremen, and lead persons shall be designated as Erosion and Sediment Control Inspectors. On matters concerning erosion control, the Erosion and Sediment Control Inspectors shall report to the CESCL.
 - 12. The Erosion and Sediment Control Inspectors shall have successfully completed "Contractor Erosion and Sediment Control Lead" (CESCL) training given by a Washington State Department of Ecology-approved provider.

C. Schedule and Sequencing

- 1. The CESCP shall include:

- a. Schedules for accomplishment of temporary and permanent erosion control work, that include as a minimum all specific work items as are applicable for clearing and grubbing; grading; construction; paving; structures at watercourses, sawcutting, and dewatering, underground utilities; Stormwater conveyances, and seeding.
 - b. Proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials;
 - c. Estimated removal date of all temporary BMPs;
 - d. Estimated date of final site stabilization.
 - e. Dates of earthwork activities.
 - f. Dates when construction activities temporarily or permanently cease on any portion of the site.
 - g. Dates when any stabilization measures are installed.
 - h. Dates when structural BMPs are initiated.
 - i. Dates for all work performed within 200 feet of sensitive environmental areas including wetlands, streams and ponds.
2. Erosion control work activities consistent with the CECSP shall be included in the Project Schedule for each work area and project activity as shown on the drawings.

D. BMP Installation

1. The CECSP shall include installation instructions and details for each BMP used during the life of the Project;
2. To prepare or modify Contractor's Erosion and Sediment Control Plans, use BMPs from the Washington State Department of Ecology, Stormwater Management Manual for Western Washington, Vol. 2, and (Current Version). May be downloaded at: <http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>
3. The CESCL shall certify that all BMP installers are trained in proper installation procedures.

E. BMP Maintenance

1. The CECSP shall include a description of the maintenance and inspection procedures to be used for the life of the project.
2. BMPs shall be maintained for the life of the project, the completion of a work phase and/or until removed by direction of the Engineer;
3. BMPs shall be maintained during all suspensions of work and all non-work periods;

4. BMPs shall be maintained and repaired as needed to assure continued performance of their intended function and in accordance with the approved CЕССР;
5. Sediments removed during BMP maintenance shall be placed away from natural and constructed storm water conveyances and permanently stabilized.
6. All maintenance shall be completed within 24 hours of inspection

F. BMP Inspection

1. The Contractor shall inspect all ТЕСС best management practices daily during workdays and anytime 0.5" of rainfall has occurred within 24 hours on weekends, holidays, and after hours. Rainfall amounts can be determined by calling (206) 444-4360 Airport Projects or contacting the National Weather Service for Sea-Tac International Airport rainfall.
2. Deficiencies identified during the inspection shall be corrected within 24 hours or as directed by the Engineer.
3. Note repairs or improvements needed, if any, and notify CESCL or site project superintendent to implement improvements;
4. Observe runoff leaving the site during storms, checking for turbid water;
5. Implement additional BMPs, if needed, to address site-specific erosion control;
6. Inspect streets surrounding site for dirt tracking;
7. Inspect for dust.
8. The Contractor shall visually inspect all stormwater runoff that discharges from the project for petroleum or chemical sheen, or "rainbow". Occurrences of sheen shall be reported immediately to the Engineer and shall follow procedures specified in Section 01631 – Pollution Prevention Planning & Execution.
9. The Contractor shall collect samples and test all stormwater runoff that discharges from the project for turbidity using a calibrated turbidimeter, and for pH using test strips that measure from pH 0 - 14. Turbidity that exceeds 25 NTUs or pH that is below 6.5 or above 8.5 shall be reported immediately to the Engineer.

G. Record keeping

1. Reports summarizing the scope of inspections, the personnel conducting the inspection, the date(s) of the inspection, major observations relating to the implementation of the CЕССР, and actions taken as a result of these inspections shall be prepared and retained as a part of the CЕССР;
2. All inspection reports shall be kept on-site during the life of the project and available for review upon request of the Engineer.

3. Copies of all inspection records and updated CЕСCP shall be submitted to the Engineer weekly.
4. The CЕСCP shall include the Contractor's inspection form which includes the following:
 - a. All best management practices to be inspected and monitored for all work areas and work activities identified in the schedule for the life of the contract.
 - b. Inspection time and date.
 - c. Weather information including current conditions, total rainfall since last inspection and rainfall in the 24 hours prior to the current inspection.
 - d. Locations of BMPs inspected.
 - e. Locations of BMPs that need maintenance and reasons why.
 - f. Locations of BMPs that failed to operate as designed or intended.
 - g. Locations where additional or different BMPs are needed and reasons why.
5. A description of stormwater discharged from the site. The CЕСCL shall note the presence of suspended sediment, turbid water, discoloration, and/or petroleum sheen.
6. Any water quality monitoring performed during inspection.
7. General comments and notes, including a description of any BMP repairs, maintenance or installations made as a result of the inspection.
8. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance CЕСCP. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation. If the site inspection indicates that the site is out of compliance, the CЕСCL shall notify the Engineer immediately.
9. Name, title, and signature of the CЕСCL conducting site inspection and the following statement: "I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

H. BMP Removal

1. After cleaning and removal, the drainage system shall not be used for temporary construction stormwater conveyance or storage.
2. Sediment removed shall be placed away from drainage conveyances and permanently covered with hydro seed or other material as directed by the Engineer.

3. Stormwater ponds used to contain construction stormwater runoff shall be returned to elevations shown on the plans.
4. Temporary BMPs shall be removed upon permanent stabilization or as directed by the Engineer.
5. Areas disturbed during removal of temporary BMPs shall be permanently stabilized.
6. Permanent stabilization shall occur upon installation of:
 - a. Concrete or asphalt pavement.
 - b. On grades 3:1 and less, soil is covered by a minimum of 80% grass growth, as determined by the Engineer.
 - c. On grades greater than 3:1 soil is covered by an approved erosion control blanket or bonded fiber matrix and a minimum of 80% grass growth, utilizing the "Line Intercept Method".
 - d. All stormwater discharges from the project meet the following criteria:
 - (1) 0-25 NTUs.
 - (2) 6.5-8.5 pH.
 - (3) No visible sheen.
 - (4) No settleable solids.
 - (5) Washington state Stormwater Quality Standards (WAC 173-201A) at the receiving water, as determined by the Engineer.

I. Emergency Response

1. The CЕСSР shall contain information on how the Contractor shall control and respond to turbid water discharges, sediment movement, and fugitive dust. At a minimum, the Contractor's employee responsible for, or first noticing, the discharges shall take appropriate immediate action to protect the work area, private property, and the environment (e.g., diking to prevent pollution of state waters). Appropriate action includes but is not limited to the following:
 - a. Hazard Assessment - assess the source, extent, and quantity of the discharge.
 - b. Securement and Personal Protection - If the discharge cannot be safely and effectively controlled, then immediately notify the CESCL and the Engineer. If the discharge can be safely and effectively controlled, proceed immediately with action to protect the work area, private property, and the environment.
 - c. Containment and Elimination of Source - Contain the discharge with silt fence, pipes, sand bags or a soil berm

down slope from the affected area. Eliminate the source of the discharge by pumping turbid water to a controlled area, building berms, piping clean water away from the area or other means necessary.

- d. Cleanup - when containment is complete, remove sediment, stabilize, dispose of contaminated water and prevent future discharge.
- e. Notification - report all discharges immediately to the Engineer.

J. Construction Dewatering

- 1. Storm water and construction dewatering water shall not be discharged to the Industrial Wastewater System (IWS) unless free from pollutants. Before discharge, water shall be measured using a properly calibrated, approved turbidity meter. Discharged water shall not exceed 200 Nephelometric Turbidity Units (NTUs) and pH levels shall be between 6.0 and 9.0. There shall be no discharge to any catch basin without specific approval of the Engineer.
- 2. The CESCO shall address how the Contractor plans to manage clean and polluted water during the life of the project. Specific procedures shall be developed and included in the CESCO when work includes excavation within 10 feet of any water, sewer, or storm system. Procedures shall address, at a minimum, locating, protecting, and connecting to existing pipes, as well as response plans for broken pipes.
- 3. The Engineer shall be notified before any disposal, hauling, pumping, or treatment of water occurs. Notification shall include location of disposal and methods of treatment.
- 4. Water shall not be pumped into ditches, gutters, drainage conveyance, catch basins, or any area that drains to one of these unless it meets the specifications outlined in this section and with prior approval of the Engineer.
- 5. Chlorinated water used for disinfecting water pipes shall not be discharged to the storm drain system.

K. Fugitive Dust Planning:

- 1. The CESCO shall detail the Contractor proposed approach to fugitive dust management. The plan shall include the following:
 - a. Identification of all fugitive dust sources for each work activity.
 - b. Description of the fugitive dust control measures to be used for each source.
 - c. Schedule, rate of application and calculations to identify how often, how much, and when the control method is to be used.

- d. Provisions for monitoring and recordkeeping.
 - e. Contingency plan in case the first control plan does not work or is inadequate.
 - f. Name and telephone number of the person responsible for fugitive dust control.
 - g. Source and availability of fugitive dust control materials.
2. The Contractor shall provide whatever means is necessary to keep fugitive dust on site and at an absolute minimum during working hours, non-working hours and any shut-down periods.
 3. The Contractor's methods for fugitive dust control will be continuously monitored and if the methods are not controlling fugitive dust to the satisfaction of the Port, the Contractor shall improve the methods or utilize new methods at no additional cost.
 4. The Contractor shall maintain as many water trucks on a site during working and non-working hours as required to maintain the site free from fugitive dust.
 5. During time periods of no construction activity, water trucks must be ready with on-site Contractor's personnel available to respond immediately to a dust or debris problem as identified by the Engineer.
 6. At no time shall there be more than a 10 minute response time to calls concerning fugitive dust/debris problems during work hours and a 90 minute response at all other times on a 24 hour basis.

L. Utilities Planning:

The CЕСP shall identify when and how all underground utility work will be conducted so that water quality compliance is maintained. At a minimum, the Contractor shall:

1. Have all shut off valves located and have procured the means to shut off valves within 10 minutes of a water line break.
2. Before cutting into an existing water line, the Contractor shall verify to the Engineer that the water line is not pressurized.
3. The Contractor shall not cut into an existing storm drain or connect new stormwater conveyance systems into existing systems until it has been verified to the Engineer there will be no discharge of non-compliant water during and after cutting and connection operations.
4. The Contractor shall grout all holes, seams, cracks, joints, cast iron rings and grates within 24 hours of installation of each item.
5. Storm systems to be demolished in place shall be first blocked at the point of connection to existing section to prevent contamination of existing storm system.
6. Chlorinated water shall be discharged to sanitary sewer or removed from the site.

7. Air plugs shall not be utilized for more than 24 hours and shall be in new condition with no leaks and monitored daily for proper air pressure.
8. Mechanical plugs shall not be utilized for more than 5 calendar days and shall be used according to the manufacturer's instructions and engineering parameters. The Contractor shall submit instructions and engineering documentation before use.
9. When a plug needs to remain in place longer than 5 days, the Contractor shall utilize grout. The grout shall be installed so that the length is one and a half times the diameter of the pipe.

M. Education:

The Contractor shall provide narrative in the CЕСSР on how they will educate all personnel including subcontractors. At a minimum, the Contractor shall:

1. Train staff through regularly scheduled meetings to discuss environmental protection subjects as related to this project. This may be added to any existing weekly meetings (such as safety meetings).
2. Training shall emphasize water quality compliance, BMP installation and maintenance, sensitive areas, emergency response, spill prevention, and inspections.
3. Minutes of the meetings detailing attendees and subjects discussed shall be kept and submitted to the Engineer weekly.
4. Prior to commencing work, all Contractor and subcontractor personnel at any tier shall complete a Port of Seattle Environmental Compliance Orientation given with the required Safety Orientation.

11.03 CONSTRUCTION REQUIREMENTS

A. Saw cutting

1. Saw cut slurry and cuttings shall be vacuumed during cutting operations;
2. Saw cut slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight;
3. Saw cut slurry and cuttings shall not drain to SDS, IWS, or any other natural or constructed drainage conveyance;
4. Collected slurry and cuttings are the responsibility of the Contractor and shall be disposed of off site in a manner that does not violate groundwater or surface water quality standards.

B. Soil and Construction Debris Stockpiles

1. Soils and construction debris, including broken concrete and asphalt paving, shall be stockpiled within the work site or off site.
2. Stockpiles shall be covered with plastic and secured from blowing wind or jet blast.
3. Plastic shall be a minimum thickness of 6 mil.
4. Materials to be stockpiled on pavement shall be placed on plastic and contained within a bermed area.
5. Clean storm water runoff from the plastic covering shall be directed away from bare soil using pipes, sandbags, or other temporary diversion devices.

C. Construction Roads, Entrances, and Exits

1. Before leaving project site, all trucks and equipment shall be inspected for mud and debris. All mud and debris shall be removed as per Section 01500 - Temporary Facilities and Controls.
2. At no time shall mud, debris, or visible sediment be allowed outside of the project boundaries and on any Port-owned and public roads.
3. Mud and debris shall be removed from pavement by vacuum sweeping and shoveling and transported to a controlled sediment disposal area identified in the CЕСP.
4. If the mud and debris are contaminated by fuels, grease, metals or other pollutants, they shall be disposed of in accordance with Section 01631 - Pollution Prevention Planning and Execution.
5. Use of water to wash concrete or asphalt pavement shall be allowed only after sediment has been removed by vacuum sweeping and shoveling, and a Road Wash Plan has been submitted and accepted by the Engineer.
6. Water used to wash pavement shall not drain into the SDS, IWS or any other natural or constructed storm water conveyance and shall be removed from Port property and disposed of off-site in accordance with local, state, and federal regulations.
7. Power brooms shall not be utilized without prior approval by the Engineer.

D. Catch Basin Protection

1. All catch basins within the project limits, and outside the project limits but within the project drainage basin, including haul roads, shall be protected
2. Catch basin protection shall be installed where shown in the project drawings, in all storm drainage structures within the work area, or as otherwise directed by the Engineer.

E. Concrete Truck and Equipment Washing

1. Concrete truck chutes, concrete pumps, hand tools, screeds, floats, trowels, rollers and all other tools shall be washed out only into Washington State Department of Ecology (WDOE)-approved covered steel containers or formed areas awaiting concrete or asphalt pavement.
2. All contained concrete waste shall be disposed of offsite in a manner that does not violate groundwater or surface water quality standards.
3. All water used for washing, is defined by the WDOE as “process water” and shall be collected and disposed of in a

manner that complies with all local, state and federal regulations.

F. Silt Fence

1. Silt fence shall be constructed at the locations shown in the project drawings, in the approved Contractor Erosion and Sediment Control Plan, or otherwise directed by the Engineer.
2. The geotextile shall be attached to the up-slope side of the posts and the wire mesh using staples, wire rings, or in accordance to the manufacturer's recommendations.
3. Where seams are required to join two sections of fence material, the seams shall be taped together, wrapped three times around a 2" steel post and the post driven into the ground. All rips, tears, holes, and other damage to silt fences shall be repaired within 24 hours of locating the damage.
4. When sediments deposits reach approximately one-third the height of the silt fence, the deposits shall be removed and disposed of outside Port property.

- G. Straw Wattle
 - 1. The installation of straw wattles shall be per WSDOT Standard Plan I-30.30-00 "Wattle Installation on Slope", or as directed by the Engineer.
- H. Bonded Fiber Matrix Soil Stabilization
 - 1. The installation of Bonded Fiber Matrix Soil Stabilization shall be applied at a minimum rate of 3,000 pounds per acre and provide a minimum of 95% soil cover. Seed and fertilizer shall be included.
- I. Temporary Organic Mulch
 - 1. Temporary organic mulch shall be applied at a minimum rate of 1.5 tons per acre.
- J. Swale Construction
 - 1. Grass-lined swales shall be constructed to the lines and grades shown on the drawings. The swale includes excavating, grading, placement of topsoil, placement of erosion control blanket, and hydroseeding as detailed on the drawings. Excavated material from the swale construction shall be considered Excess Soil as defined in Section 02330 – Excavation and Embankment.
- K. Construction Stormwater

End of Section

DIVISION 2 - SITE WORK

Section 02743 - Bituminous Concrete Pavement

PART 12 GENERAL

12.01 SUMMARY

- A. Extent of Work: The extent of "Bituminous Concrete Pavement" work is indicated on the drawings.
 - 1. The work includes the requirements for producing, transporting, placing, shaping and compacting of one or more courses of materials in conformance with these specifications and the dimensions and sections indicated on the drawings or within the lines and grades established by the Engineer.

- B. Related Documents: The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements, apply to the work as if specified in this section.
- C. Related Work Specified Elsewhere:
 - 1. Section 01140 - Operational Safety on Airports
 - 2. Section 02300 - Earthwork
 - 3. Section 02722 - Base Course
 - 4. Section 02732 - Crushed Stone Surfacing
 - 5. []
- D. Air Operations: All, or a portion of, the work covered by this Section is to be conducted within the Air Operations Area (AOA) at Sea-Tac International Airport. Restrictions and conditions necessary to maintain airfield and aircraft safety as required by FAA regulations, and as required to maintain efficient airport operations, may impose limitations upon the Contractor's methods and procedures. Section 01140 - Operational Safety on Airports, lists the applicable conditions, limitations and regulations.

12.02 AGGREGATES

- A. Aggregates for bituminous concrete shall be manufactured from ledge rock, talus, or gravel and shall meet the requirements of the WSDOT Standard Specifications.
- B. Tests: Tests, testing methods and results shall be as specified in the WSDOT Standard Specifications.
- C. Grading: Shall be as required by the WSDOT Standard Specifications for Class B asphalt concrete and such other classes called for on the drawings. Course and fine aggregates shall be proportioned in the approximate ratio of 35% Coarse to 65% Fine aggregates.
- D. Blending Sand in an amount specified by the Engineer may be used to make up a deficiency of material passing a U.S. No. 40 sieve, provided, however, that the aggregate in the final mix meets pertinent fracture requirements. Blending sand shall meet the requirements of the WSDOT Standard Specifications.
- E. Mineral Filler shall meet the requirements of the WSDOT Standard Specifications.

12.03 BITUMINOUS MATERIALS

- A. Bituminous Materials shall meet the requirements of the WSDOT Standard Specifications.
 - 1. Prime coat shall be liquid asphalt MC-70 or RC-70.
 - 2. Tack coat shall be emulsified asphalt CSS-1 or CRS-1.
 - 3. Joint Sealer shall be paving asphalt Viscosity Grade AR-4000W.

4. Asphalt for concrete shall be Viscosity Grade AR-4000W penetration paving asphalt.

12.04 PROPORTIONS OF MATERIALS

- A. The materials of which Bituminous concrete is composed shall be of such sizes, gradings and quantities that, when proportioned and mixed together, they will produce a well-graded mixture within the requirements listed in the WSDOT Standard Specifications.
- B. The actual proportions of the several components to be used in the production of the asphalt concrete mixture shall be determined by the Engineer within the WSDOT specified limits to provide a pavement having surface texture, air flow, stabilometer and cohesiometer values satisfactory to the Engineer. The proportions so fixed shall be changed only by his order.

PART 13 EXECUTION

13.01 PRIME COAT

- A. Apply prime coat to the surface to receive bituminous concrete pavement only as directed by the Engineer. The application rate will be determined by the Engineer but shall not exceed 0.40 gallon per square yard at a temperature of 120° - 180°F.

13.02 TACK COAT

- A. Apply tack coat [over existing [asphalt] [cement concrete] [paving or] as directed by the Engineer. The application rate for Tack Coat will be determined by the Engineer but shall not exceed 0.15 gallon per square yard. Areas to receive Tack Coat must be approved by the Engineer prior to application.

13.03 JOINT SEALER

- A. Apply joint sealer to the edges of new paving joints, catch basins, manholes, etc., as directed by the Engineer.

13.04 ASPHALT CONCRETE

- A. Mix, handle, batch, haul, place, roll and compact asphalt concrete in accordance with the applicable sections of the WSDOT Standard Specifications except that the maximum thickness for a course shall be two inches. Place the material to the dimensions and grades indicated on the drawings or as directed by the Engineer.

DIVISION 2 - SITE WORK

Section 02992 - Hydroseeding for Erosion Control and Landscaping

PART 14 GENERAL

14.01 DESCRIPTION

- A. This item shall consist of the application of seed, fertilizer and mulch with tackifier in areas shown on the plans or as directed by the Engineer in accordance with these specifications.
- B. The extent and location of seeding work includes all areas not paved in this project which are disturbed by construction, grading, pavement removal, utility installation and any other of the Contractor's operations or as directed by the Engineer in accordance with these specifications.

14.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and other sections of the General Requirements, and:
 - 1. Section 01305 - Preconstruction Submittals
 - 2. Section 01330 - Submittal
 - 3. Section 02270 - Temporary Erosion and Sediment Control Planning and Execution
 - 4. Section 02330 - Excavation and Embankment (FAA)
 - 5. Section 02332 - Clearing and Grubbing (FAA)

14.03 SUBMITTALS

- A. The Contractor shall submit test report and product information in accordance with Section 01330 - Submittal for the following:
 - 1. Seed mixture and application rates;
 - 2. Signed vendor certification statement for seed testing;
 - 3. Product information on fertilizer with proportioning of elements;
 - 4. Product information on Bonded Fiber Matrix;
 - 5. Product information on tackifier;
 - 6. Application rates for tackifier, seed, fertilizer and mulch;
 - 7. Signed vendor certification statement for high endophytes;

14.04 TESTING

- A. Testing Specifications and frequency of testing shall meet the requirements set forth in this section. Any submittals not listed above, but that are required by these specifications or as may be required by the Engineer to approve or accept a product or material shall be provided by the Contractor at no additional cost to the Port.

14.05 QUALITY ASSURANCE

- A. Sampling and testing for compliance with the contract provisions shall be in accordance with Section 01451 - Quality Control; Testing Laboratory Services and as outlined in this section. The Contractor shall provide copies of test results to the Engineer.

PART 15 PRODUCTS

15.01 SEED

- A. Contract shall be based on the bidder having verified, prior to the time of bidding, sources of supply to ensure that all the seed listed in the table below can be supplied no later than the beginning of work.
- B. Seed shall be furnished separately or in mixtures in standard unopened containers with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked on the outside of the container for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed.
- C. For commercially grown seed, the Contractor shall submit for the Engineer's approval the seed vendor's analysis, including percent of pure seed, germination and germination test date, other crop and weed seed and inert material. For seed that is not commercially grown, the Contractor shall provide the name of the seed collector, dates and locations of collection.
- D. Contractor shall protect seed from dehydration, contamination and heating during delivery, storage and handling. Seed shall be stored in a cool, dry location away from contaminants.
- E. Seed shall be a high endophyte mix of the following:

Rate of Application

SEED TYPE	% BY WEIGHT	% PURITY	% GERMINATION	LBS./ACRE
Creeping Fescue	15	98	90	15
Perennial Rye	60	98	90	60
Chewings Fescue	25	98	90	25

15.02 BONDED FIBER MATRIX (BFM)

- A. BFM shall be "SoilGuard", "EcoAegis", "HydroBlanket", or approved equivalent, and shall contain all ingredients including tackifier, crosslinkers, and other proprietary ingredients.

15.03 FERTILIZER

- A. Fertilizer shall be standard commercial fertilizer supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid and water-soluble potash. They shall be furnished in standard containers with name, weight and guaranteed analysis of contents clearly marked thereon. No Cyanamid compounds or hydrated

lime shall be permitted in mixed fertilizers. Nitrogen shall be in an insoluble and slow release form. Fertilizer shall not be agitated for more than 20 minutes before application.

- B. Fertilizers shall be of commercial fertilizer grade and shall be spread at the rate of 375 lb./acre. Fertilizers shall consist of the following elements in the proportions shown by weight, uniformly mixed to ensure even distribution:
 - 1. 16 parts per 100 total nitrogen
 - 2. 16 parts per 100 water-soluble potassium compounds
 - 3. 16 parts per 100 available phosphoric acid

15.04 TACKIFIER

- A. Tackifier for hydroseeding shall be Stockopam, SoilBinder or approved equal. The PAM shall be a long chain, water-soluble or linear, non-crosslinked, anionic (>20% hydrolysis) or nonionic.
- B. PAM tackifier shall be certified for compliance with ANSI/NSF Standard 60 for drinking water treatment and have a 0.05% maximum and an average 0.02% AMD concentration. The PAM anionic charge density may vary from 2-30%; a value of 18% is typical.

PART 16 EXECUTION

16.01 ADVANCED PREPARATION AND CLEANUP

- A. Landscaping
 - 1. Areas to be seeded shall be raked smooth and cleared of stones, clods, rocks, roots, or other undesirable matter larger than 2 inches (50 mm) in any diameter that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas.
 - 2. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of hydroseed, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities and repairing other incidental damage.
- B. Temporary/Permanent Erosion Control
 - 1. An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to hydroseeding, the top 3 inches (75 mm) of soil is loose, friable, and if shaped to the required grade.
 - 2. Areas to be seeded shall be cleared of stones, clods, rocks, roots, or other undesirable matter larger than 6 inches (50 mm) in any diameter, that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas.

3. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of hydroseed, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities and repairing other incidental damage.
4. All areas to be hydroseeded for temporary erosion control shall be roughened with equipment tracks, disc, ripper tooth, or other means approved by the Engineer before application of hydroseed.

16.02 HYDROSEED APPLICATION METHOD

A. General

1. The rates of application shall be as follows:

Seed	100 lbs./acre
Fertilizer	375 lbs./acre
Bonded Fiber Matrix	3,000 lbs./acre
Tackifier	3-5 lbs/acre

B. Spraying Equipment:

1. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.
2. The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 pounds per square inch (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipelines shall be capable of providing clearance for 5/8-inch (15 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.
3. The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m).

One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

4. In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

C. Mixtures:

1. All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source, which is disapproved by the Engineer following such tests.
2. All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Engineer. Fertilizer shall not be agitated for more than 20 minutes.

D. Spraying

1. Mixtures of seed, fertilizer, mulch and tackifier shall only be sprayed upon previously prepared seedbeds. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.
2. Particular care shall be exercised to insure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.
3. Checks on the rate and uniformity of application may be made by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon, or using the U.S. Department of Agriculture/Natural Resource Conservation Service (USDA/NRCS) Line Intercept Method, or other method approved by the Engineer.
4. Contractor shall install BFM in areas shown on the plans and as directed by the Engineer. BFM shall cover a minimum of 95% of the soil surface and shall be applied in two directions or directed upwards to ensure proper soil coverage. BFM shall cure a

minimum of 24 hours before any rain event or irrigation occurs and shall be installed per manufacturer's instructions.

16.03 MAINTENANCE OF SEEDED AREAS

- A. The Contractor shall establish an acceptable stand of grass of uniform color and density to the satisfaction of the Engineer. If at the time when the contract has been otherwise completed it is not possible to make an adequate determination of the color, density and uniformity of such stand of grass, payment for the unaccepted portions of the areas seeded out of season will be withheld until such time as these requirements have been met.
- B. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged, following seeding, shall be repaired by re-grading and reseeding as directed. The Contractor shall mow, water as directed and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.
- C. When seed, fertilizer, mulch, and tackifier is applied between June 1 and August 31, the Contractor shall protect the application from dehydration and when applied between October 15 and March 31, the Contractor shall protect the application from freezing and excess moisture.
- D. An acceptable stand of grass shall be defined as a minimum of 75% grass coverage of bare soil using the U.S. Department of Agriculture/Natural Resource Conservation Service (USDA/NRCS) Line Intercept Method or other method approved by the Engineer.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

DIVISION 2 SITE WORK

SECTION 02100

SITE PREPARATION

TABLE OF CONTENTS

GENERAL

1.1 GENERAL

PRODUCTS

Not Used

EXECUTION

3.1 SITE BOUNDARIES

3.2 GRUBBING

3.3 DISPOSAL OF CLEARED MATERIALS

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.1 GENERAL

The contractor shall provide the labor, equipment and materials to clear and grub the site of all brush, trees, stumps, and other materials as specified herein.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 SITE BOUNDARIES

The Contractor will locate all structures and access roads by establishing line and grade in the vicinity of each structure. The contractor shall verify established control points, perform any additional surveys and maintain control points as required to ensure the accuracy of the work.

3.2 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots larger than 1-1/2 inches in diameter, matted roots, and subsurface piping, where indicated, from the designated grubbing areas. This material, together with logs and other organic or metallic debris not suitable for foundation purposes shall be excavated and removed to a depth of not less than 18 inches below the final ground elevation in areas indicated to be grubbed and in areas indicated as construction areas for access roads or walkways. Depressions made by grubbing shall be filled with suitable material and compacted such that the finished surface shall match the adjacent surface in composition, degree of compaction, and elevation.

3.3 DISPOSAL OF CLEARED MATERIALS

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

All brush, and other refuse from the clearing operations shall be removed from site and disposed of at the contractor's expense and at no extra cost to the Government. Disposal of material shall not be permitted on airport property or government property.

END OF SECTION

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 02200

EARTHWORK

TABLE OF CONTENTS

GENERAL

- 1.1 GENERAL
- 1.2 REFERENCES
 - 1.2.1 American Association of State Highway and Transportation Officials (AASHTO)
 - 1.2.2 American Society for Testing and Materials (ASTM) Standard

PRODUCTS

Not Used

EXECUTION

- 3.1 EXCAVATION
 - 3.1.1 Classification
 - 3.1.2 Drainage
 - 3.1.3 Freezing
 - 3.1.4 Excavation for Slabs and Footings
 - 3.1.4.1 Limits
 - 3.1.5 Trench Excavation
 - 3.1.6 Excavation for Walkways and Access Roads
 - 3.1.7 Excavation of Ditches, Swales and Culverts
 - 3.1.8 Safety and Protection of Work
 - 3.1.9 Utilization of Excavated Materials
 - 3.1.10 Inspection of Excavated Area
- 3.2 FILL AND BACKFILL
 - 3.2.1 Weather Conditions
 - 3.2.2 Satisfactory Material
 - 3.2.3 Preparation of Surface for Fill and Embankment
 - 3.2.4 Source of Fill Material
 - 3.2.5 Fill for Slabs and Foundations
 - 3.2.6 Backfilling of Conduit Trenches
 - 3.2.7 Fill and Embankment for Access Roads, Walkways, and Culverts

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 3.2.8 Fill for Open Areas
- 3.2.9 Placing of Crushed Rock and Topsoil
- 3.2.10 Compaction Methods
- 3.2.11 Determination of Density

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.1 GENERAL

The contractor shall perform and complete all work as necessary for excavation, filling, backfilling, and grading required on the applicable drawings and specified herein.

1.2 REFERENCES

The latest edition in effect of the following publications form a part of this specification and are applicable to the extent specified herein.

1.2.1 American Association of State Highway and Transportation Officials (AASHTO)

- | | |
|-------------|--|
| AASHTO-T99 | Moisture-Density Relations of Soils |
| AASHTO-T191 | Field Determination of Density of Soil in Place, Sand Cone Method |
| AASHTO-T204 | Field Determination of Density of Soil in Place, Dry Cylinder Method |
| AASHTO-T205 | Field Determination of Density of Soil in Place, Rubber Balloon Method |
| AASHTO-T233 | Field Determination of Density of Soil in Place, Block, Chunk or Core |

1.2.2 American Society for Testing and Materials (ASTM) Standard

- | | |
|------------|---|
| ASTM D-424 | Test for Plastic Limit and Plastic Index of Soils |
|------------|---|

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 EXCAVATION

3.1.1 Classification

All material excavated is unclassified and can be accomplished by trencher or backhoe and will not require ripping or blasting.

3.1.2 Drainage

Excavation shall be performed so that the area of the site and the area immediately surrounding the site and affecting operations at the site will be continually and effectively drained. Water shall not be permitted to accumulate in the excavation. The excavation shall be drained by pumping or other satisfactory methods to prevent softening of the foundation bottom, undercutting of footings, or other actions detrimental to proper construction procedures.

3.1.3 Freezing

When freezing weather is expected, excavations shall not be made to the full depth, unless the footing concrete can be placed immediately. If excavation is already at full depth, the excavation shall be protected from frost.

3.1.4 Excavation for Slabs and Footings

The excavations shall conform to the dimensions and elevations of the drawings applicable to footings and other foundation structures which are cast in place.

3.1.4.1 Limits

Excavations below indicated depths shall not be permitted except to remove material consisting of shale, sod, clods, stones larger than 4 inches, organic debris, trash or frozen material. Such unsatisfactory material shall be removed to a depth of 6 inches and replaced with satisfactory fill material. Unauthorized over excavation for footings shall be replaced at no additional cost to the

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

Government to the indicated excavation grade with concrete. Excavation shall extend a sufficient distance from footings to allow for placing and removal of forms, installation of services, and for inspection, except where the concrete for walls and footings is authorized by the Resident Engineer to be deposited directly against excavated rock surfaces.

3.1.5 Trench Excavation

Trenches for conduits and other utilities shall conform to the dimensions and elevations shown on the applicable drawings. The banks need not be kept vertical but may be sloped or widened to such general limits as may be set by the Resident Engineer, provided there is no interference with other utilities. The trench bottom shall be a minimum of 6 inches wide or as required to provide separation between power and control cables or between power cables of different voltages. The trench depth shall be deep enough to allow cable placement plus an over excavation of at least three inches. The over excavation shall be filled with earth or sand containing no material aggregate particles that would be retained on a 1/4-inch sieve. The conduits will be backfilled with sand or CDF so there is a min. of coverage of 6 inches. All bedding and backfill shall be compacted to a min. of 95% max. dry dry density as determined by AASHTO-T99.

3.1.6 Excavation for Walkways and Access Roads

The excavation shall conform to the dimensions and elevations of the drawings applicable to areas designed for vehicular and pedestrian traffic. Subgrade areas for access roads and walkways shall be plowed, disked and moistened or aerated as required obtain proper compaction. Muck, peat and other unsatisfactory material shall be removed to a minimum depth of 12 inches below excavation grade or as required to provide a satisfactory foundation. Low areas resulting from removal of such material shall be brought up to required grade with satisfactory fill material.

3.1.7 Excavation of Ditches, Swales and Culverts

Not Used.

3.1.8 Safety and Protection of Work

Sheeting and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel. The manner of bracing excavations shall comply with local regulations and OSHA construction regulations. Grading shall be performed in a manner to ensure proper drainage at all times.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

3.1.9 Utilization of Excavated Materials

Satisfactory excavated material shall be used in the work insofar as practicable. No excavated material shall be disposed of in such a manner as to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.1.10 Inspection of Excavated Area

When excavations have reached the required elevations, the contractor shall not proceed with further construction of the excavated area until the area has been inspected by the Resident Engineer.

3.2 FILL AND BACKFILL

3.2.1 Weather Conditions

No fill or backfill operations shall be performed when weather conditions are determined by the Resident Engineer to be too wet or cold to permit such operations.

3.2.2 Satisfactory Material

Material suitable for fill, backfill and embankment purposes shall be reasonably free of shale, sod, clods, and stones larger than 4 inches, organic debris, trash and frozen material. Only materials suitable for obtaining the degree of compaction specified herein shall be used.

3.2.3 Preparation of Surface for Fill and Embankment

All surfaces designated to receive fill and embankment material shall be inspected prior to material placement. Soil surfaces on which compacted fill is to be placed shall be plowed, disked or otherwise broken up to a depth of 6 inches, pulverized, moistened or aerated as necessary, mixed and compacted to the same density as required for the fill or embankment material. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be stepped or benched, as directed, in such manner that the fill material will bond with the existing surface. The finished surface shall be reasonable smooth, compacted and free from irregular surface changes. The degree of finish shall be that ordinarily obtained from blade-grader operations or, where more suitable, hand raking.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

3.2.4 Source of Fill Material

Fill material shall be selected for the particular fill area for which it is to be used. Fill material shall not be confused with surfacing aggregate. Necessary clearing, grubbing, and disposal of debris, shall be considered incidental operations to the borrow excavation and shall be performed by the contractor. All material stockpiled on site shall either be used as fill material or disposed of by the contractor.

3.2.5 Fill for Slabs and Foundations

Satisfactory material shall be placed in horizontal layers of 6 inches (loose measurement) and compacted to 95 percent maximum dry density. Unless directed by the Resident Engineer, no backfill shall be placed against footings prior to 7 days after footings and slabs are poured.

3.2.6 Backfilling of Conduit Trenches

Trenches shall be backfilled as indicated on the drawings. Unless otherwise indicated, backfilling of the conduit trenches shall be done as follows:

- Conduit spacers are required at 5 foot centers along the trench to maintain the required horizontal and vertical separation between conduits.
- Place concrete until a min. of 6 inches of coverage is attained for those areas designated to have concrete encased duct banks.
- Place sand to a level of 12 inches above the top of the conduits.
- TAMP and COMPACT select fill to a minimum of 95% of maximum dry density in accordance with AASHTO-T-99.
- Place guard wire and warning tape.
- Place approximately 14" of select fill above sand (select fill shall contain no particles that would be retained on a 1 inch sieve).
- TAMP and COMPACT select fill to a minimum of 95% of maximum dry density in accordance with AASHTO-T-99. Compacted depth should be approximately 12" above sand.
- Place approximate 14" more of select fill if needed.
- TAMP and COMPACT again to a minimum of 95% of maximum dry density in accordance with AASHTO-T99.
- Place the remaining amount of select fill required and COMPACT and TAMP a third time. COMPACT again to a minimum of 95% of maximum dry density in accordance with AASHTO-T99.. The finished level of the top of the trench shall not exceed 1 inch above the surrounding grade.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

The disturbed area shall be cleaned, raked, and seeded. Grass seed and fertilizer shall be of a similar mixture as used in SEA AND BLI. All trench backfilling shall be to the approval of the Airport Manager and the Project Engineer. THE CONTRACTOR SHALL GUARANTEE THAT NO SETTLEMENT OCCURS WHICH LEAVES A DEPRESSION BELOW THE SURROUNDING GRADE FOR A PERIOD OF ONE YEAR AFTER PROJECT COMPLETION.

3.2.7 Fill and Embankment for Access Roads, Walkways, and Culverts

Fills and embankments shall be constructed at the locations and to lines and grades indicated on the drawings. The material shall be placed in successive horizontal layers of 8 inches, loose measure, for the full width of the cross section. Fills and embankments shall be compacted to 95 percent of maximum dry density in accordance with AASHTO T-99. Final elevations after compaction shall not vary more than 0.05 feet from the established grade and approved cross section.

3.2.8 Placing of Crushed Rock and Topsoil

On areas to receive crushed rock or topsoil material, the compacted fill or subgrade shall be scarified to a depth of 2 inches. Material to be placed shall then be evenly spread, graded and compacted to 95 percent of maximum dry density in accordance with AASHTO-T99. Material required to be placed within two feet of footings or slabs shall be compacted by approved hand tampers. Compaction of topsoil to be grassed or sodded may be deferred until after seeding or sodding operations.

3.2.9 Compaction Methods

Compaction shall be performed using the method and equipment suitable for the area as specified. Mechanical hand tampers shall be used only in areas adjacent to footings and slabs or in trenches or other areas where use of rollers is not practical. Compaction with pneumatic-tired rollers, three wheel power rollers, sheepsfoot rollers, etc., shall be used in all other areas as required to provide the specified compaction density.

3.2.10 Determination of Density

Maximum density tests will be performed in accordance with AASHTO-T99 and field density tests will be performed in accordance with AASHTO-T191, T204, T205, or T233.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

END OF SECTION

SECTION 2201

GEOWEB

SECTION 2201

SOIL STABILIZATION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Work Included: This Section includes providing all material, labor, tools and equipment for installation of Cellular Confinement System as shown in the Contract Documents and as specified in this Section.
- B. The Cellular Confinement System shall be used for load support.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO M 218 - Steel Sheet, Zinc-Coated (Galvanized) for Corrugated Steel Pipe.
 - 2. AASHTO M 288 - Geotextile Specification for Highway Applications
- B. American Society of Testing and Materials (ASTM)
 - 1. ASTM D 1505 - Density of Plastics by the Density-Gradient Technique.
 - 2. ASTM D 1603 - Standard Test for Carbon Black in Olefin Plastics
 - 3. ASTM D 1693 - Environmental Stress-Cracking of Ethylene Plastics.
 - 4. ASTM D 5199 - Measuring Nominal Thickness of Geotextiles and Geomembranes.
 - 5. ASTM E 41 - Terminology Relating to Conditioning.

1.3 SUBMITTALS

- A. Submit Manufacturer's shop drawings, including Manufacturer's product data, samples and section layout.
- B. Submit manufacturer's certification of polyethylene used to make Geoweb material including
 - 1. Manufacturer's certification of percentage of carbon black.

2. Resin manufacturer's certification of polyethylene density and Environmental Stress Crack Resistance (ESCR).

A. Submit qualifications certifying the installer is experienced in the installation of the specified products.

B. Submit qualifications of Manufacturer's field representative certifying the field representative is experienced in the installation of the specified products.

C. No material will be considered as an equivalent to the Geoweb material specified herein unless it meets all requirements of this specification, without exception. Manufacturers seeking to supply what they represent as equivalent material must submit records, data, independent test results, samples, certifications, and documentation deemed necessary by the Engineer to prove equivalency. The Engineer shall approve or disapprove other Manufacturers materials in accordance with the General Conditions after all information is submitted and reviewed. Any substitute materials submitted shall be subject to independent lab testing at the Contractor's expense.

1.4 QUALITY ASSURANCE AND CONTROL

A. The cellular confinement system material shall be provided from a single Manufacturer for the entire project.

B. The Manufacturer's Quality management system shall be certified and in accordance with ISO 9001:2008 and CE certification. Any substitute materials submitted shall provide a certification that their cellular confinement manufacturing process is part of an ISO program and a certification will be required specifically stating that their testing facility is certified and in accordance with ISO. An ISO certification for the substitute material will not be acceptable unless it is proven it pertains specifically to the Geoweb manufacturing operations.

C. The Manufacturer shall provide certification of compliance to all applicable testing procedures and related specifications upon the customer's written request. Request for certification shall be submitted no later than the date of order placement. The Manufacturer shall have a minimum of 20 years experience producing cellular confinement systems.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and Manufacturer.

B. The materials shall be stored in accordance with Manufacturer's instructions. The materials shall be protected from damage and out of direct sunlight.

- C. The materials shall be delivered, unloaded and installed in a manner to prevent damage.

1.6 WARRANTY

- A. The Manufacturer shall warrant each Geoweb section that it ships to be free from defects in materials and workmanship at the time of manufacture. The Manufacturer's exclusive liability under this warranty or otherwise will be to furnish without charge to the original f.o.b. point a replacement for any section which proves to be defective under normal use and service during the 10-year period which begins on the date of shipment. The Manufacturer reserves the right to inspect any allegedly defective section in order to verify the defect and ascertain its cause.
- B. This warranty shall not cover defects attributable to causes or occurrences beyond the Manufacturer's control and unrelated to the manufacturing process, including, but not limited to, abuse, misuse, mishandling, neglect, improper storage, improper installation, improper alteration or improper application.
- C. In no event shall the Manufacturer be liable for any special, indirect, incidental or consequential damages for the breach of any express or implied warranty or for any other reason, including negligence, in connection with the cellular confinement system.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

Presto Geosystems, PO Box 2399, Appleton, Wisconsin 54912 2399.
Toll Free (800) 548 3424. Phone (920) 738 1342. Fax (920) 738 1222.
E Mail bryan.wedin@prestogeo.com. Website www.prestogeo.com.

2.2 GEOWEB CELLULAR CONFINEMENT SYSTEM

A. Manufacturing Certification

- 1. The manufacturer shall have earned a certificate of registration, which demonstrates that its quality-management system for its Geoweb cellular confinement system is currently registered to the ISO 9001:2008 and CE quality standards.

B. Base Materials

- 1. Polyethylene Stabilized with Carbon Black
 - a) Density shall be 58.4 to 60.2 lbs/ft³ (0.935 to 0.965 g/cm³) in accordance with ASTM D 1505.
 - b) Environmental Stress Crack Resistance (ESCR) shall be 5000 hours in accordance with ASTM D 1693.

- c) Ultra-Violet light stabilization with carbon black.
- d) Carbon Black content shall be 1.5 to 2 percent by weight, through addition of a carrier with certified carbon black content.
- e) Carbon black shall be homogeneously distributed throughout material.
- f) The manufacturer must have an in-place quality control to prevent irregularities in strip material.

C. Cell Properties

- 1. Individual cells shall be uniform in shape and size when expanded.
- 2. Individual cell dimensions (nominal) shall be plus or minus 10%.
- 3. GW20V-Cell
 - a) Length shall be 8.8 inches (224 mm).
 - b) Width shall be 10.2 inches (259 mm).
 - c) Nominal area shall be 44.8 in² (289 cm²) plus or minus 1%.
- 4. Nominal cell depth shall be 8 inches (200 mm)

D. Strip Properties and Assembly

- 1. Perforated Textured Strip/Cell
 - a) Strip sheet thickness shall be 50 mils (1.27 mm), minus 5 percent, plus 10 percent in accordance with ASTM D 5199. Determine thickness flat, before surface disruption.
 - b) Polyethylene strips shall be textured surface with a multitude of rhomboidal (diamond shape) indentations.
 - c) Textured sheet thickness shall be 60 mils, plus or minus 6 mils (1.52 mm plus or minus 0.15 mm).
 - d) Indentation surface density shall be 140 to 200 per in² (22 to 31 per cm²).
 - e) Perforated with horizontal rows of 0.4 inch (10 mm) diameter holes.
 - f) Perforations within each row shall be 0.75 inches (19 mm) on-center.
 - g) Horizontal rows shall be staggered and separated 0.50 inches (12 mm) relative to hole centers.
 - h) Edge of strip to nearest edge of perforation shall be a minimum of 0.3 inches (8 mm).
 - i) Centerline of spot weld to nearest edge of perforation shall be a minimum of 0.7 inches (18 mm).
 - j) A slot with a dimension of 3/8 inch x 1-3/8 inch (10 mm x 35 mm) is standard in the center of the non-perforated areas and at the center of each weld.

E. Assembly of Cell Sections

1. Fabricate using strips of sheet polyethylene each with a length of 142 inches (3.61 m) and a width equal to cell depth.
2. Connect strips using full depth ultrasonic spot-welds aligned perpendicular to longitudinal axis of strip.
3. Ultrasonic weld melt-pool width shall be 1.0 inch (25 mm) maximum.
4. Weld spacing for GW20V-cell sections shall be 14.0 inches plus or minus 0.10 inch (356 mm plus or minus 2.5 mm).

F. Cell Seam Strength Tests

1. Minimum seam strengths are required by design and shall be reported in test results. Materials submitted with average or typical values will not be accepted. Written certification of minimum strengths must be supplied to the Engineer at the time of submittals.
2. Short-Term Seam Peel-Strength Test
 - a) Cell seam strength shall be uniform over full depth of cell.
 - b) Minimum seam peel strength shall be 640 lbf (2,840 N) for 8 inch (200 mm) depth.
3. Long-Term Seam Peel-Strength Test
 - a) Conditions: Minimum of 7 days in a temperature-controlled environment that undergoes change on a 1 hour cycle from room temperature to 130 degrees F (54 degrees C).
 - b) Room temperature shall be in accordance with ASTM E41.
 - c) Test samples shall consist of two, 4 inch (100 mm) wide strips welded together.
 - d) Test sample consisting of 2 carbon black stabilized strips shall support a 160 pound (72.5 kg) load for test period.

2.3 INTEGRAL COMPONENTS

A. ATRA® Key

1. ATRA keys shall be constructed of high strength, aluminized metal.
2. ATRA keys shall be used to connect Geoweb panels together at each interleaf and end to end connection.
3. ATRA keys shall provide minimum break strength of 265 lbf.

2.4 CELL INFILL MATERIALS

- A. Cell infill material shall be crushed aggregate with a maximum particle size of 2 inches (75 mm) with a fine content of less than 10%.
- B. Infill material shall be free of any foreign material.

C. Clays, silts and organics are not acceptable infill material.

D. Infill material shall be free-flowing and not frozen when placed in the Geoweb sections.

2.5 ADDITIONAL COMPONENTS

A. Geotextile

1. The geotextile separation layer shall be a high strength woven geotextile, Mirafi HP270, or equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions are as indicated on the drawings. Notify the Engineer if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.
- B. Verify layout of structure is as indicated on the drawings. Notify the Engineer if layout of structure is not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

3.2 INSTALLATION OF LOAD SUPPORT SYSTEMS

- A. Prepare subgrade and install the Geoweb load support system in accordance with Manufacturer's instructions.
- B. Subgrade Preparation
 1. Excavate and shape foundation soils as indicated on the drawings.
 2. Ensure foundation soil meets minimum strength requirements through proof rolling or other conventional method and is approved by the Engineer. If unacceptable foundation soils are encountered, excavate and replace with suitable quality material as directed by the Engineer.
 3. Install specified geotextile separation layer on top of prepared subbase ensuring required overlaps are maintained and outer edges of the geotextile are buried in accordance with the Manufacturer's recommendations.
- C. Geoweb Section Placement and Connection
 1. Place Geoweb sections and verify all sections are expanded uniformly to required dimensions and that outer cells of each section are correctly aligned. Interleaf or overlap edges of adjacent sections. Ensure upper surfaces of adjoining Geoweb sections are flush at joint and adjoining cells are fully aligned at the cell wall slot.

2. Connect the Geoweb sections with ATRA keys at each interleaf and end to end connection. Insert the ATRA key through the cell wall slot before inserting through the adjacent cell. Turn the ATRA key 90 degrees to lock the panels together.

D. Crushed Aggregate Infill Placement

1. Place the specified aggregate infill with suitable material handling equipment.
2. Infill material shall be free-flowing and not frozen when placed in the Geoweb sections.
3. Overfill cells with aggregate infill material. Limit the drop height of infill material to 3 feet (1 meter) to avoid damage or displacement of the cell wall.
4. Level surface approximately 2 inches (50 mm) above cell walls. Maintain the 2 inch wear surface over the Geoweb sections to prevent damage to the cell walls.
5. Compact infill to a minimum of 95 percent of max. dry density as per AASHTO T-99.
6. Shape compacted surface to required elevation as indicated on the drawings.

Appendix

A

Short-Term Seam Strength Test Procedure

Frequency of Test

The short-term seam peel strength test (referred to as the test in this section) shall be performed on a geocell section randomly taken directly from the production line each two hours.

Test Sample Preparation

Randomly choose 10 welds within the selected section and cut those welds from the section such that 10 cm (4 in) of material exist on each side of the weld. The test sample shall have a general appearance as illustrated in Figure A1. Prior to testing, the test samples shall have air cool for a minimum of 30 minutes from the time the selected geocell section was manufactured.

Short-term Seam Peel Strength Test

The apparatus used for testing the short-term seam peel strength shall be of such configuration that the jaws of the clamp shall not over stress the sample during the test period. Load shall be applied at a rate of 12 in (300 mm) per minute and be applied for adequate time to determine the maximum load. The date, time and load shall be recorded.

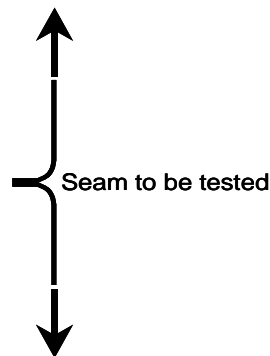


Figure A1

Short-term seam peel strength shall be defined as the maximum load applied to the test sample. Minimum required short-term seam peel strength shall be:

- 640 lbf (2840 N) for the 8 in (200 mm) depth cell
- 480 lbf (2130 N) for the 6 in (150 mm) depth cell
- 320 lbf (1420 N) for the 4 in (100 mm) depth cell
- 240 lbf (1060 N) for the 3 in (75 mm) depth cell.

Definition of Pass / Failure

Two methods shall be used to determine acceptability of the manufactured geocell sections. The successful passing of the short-term seam peel test shall not be used to determine acceptable of the polyethylene for use in manufacturing of the geocell sections. Acceptability of the polyethylene shall be determined through tests conducted in Appendix B.

The Tested Value

If more than one of the tested seam samples fails to meet the minimum peel strength, all sections manufactured after the previously successful test shall be rejected.

If all tested seam samples meet the minimum peel strength, all geocell sections manufactured since the last successful test shall be considered to have passed the test.

When one of the tested seam samples fails to meet the minimum peel strength, another 10 samples shall be randomly selected and cut from the previously selected section. If more than one of these samples fails, all sections manufactured after the previously successful test shall be rejected. Otherwise, all geocell sections manufactured since the last successful test shall be considered to have passed the test.

Visual Failure Mode

After each sample is tested, the seam shall be examined to determine the failure mode. Two failure modes are possible.

- Material failure within and adjacent to the weld indicated by material strain and

- Weld failure resulting in complete separation of the seam and shows little or no material strain.

Upon examination, when the failure mode results in complete separation of the seam and indicates little or no material strain, product manufactured shall be rejected.

Appendix

B

Long-Term Seam-Strength Test Procedure

Frequency of Test

The long-term seam peel strength test (referred to as the test in this section) shall be performed:

1. on each new resin lot number if the geocell manufacturer extrudes the sheet or strip used to produce the geocell material.
2. on each new order of sheet and/or strip if the geocell manufacturer does not extrude the sheet and/or strip used to produce the geocell material.

Test Sample Preparation

A test sample shall be made using two sets of two strips meeting all aspects of the material portion of this specification. Testing shall be done on non-perforated samples to obtain the true seam strength of the bond. One set of two strips are to be welded in welder position "A" and the other set of two strips are to be welded in welder position "B" producing two 1-cell long sections of geocell product. Welding should be done using a warm welder. The welded samples shall be labeled "A" and "B" and the weld seams of each sample shall be numbered consecutively from left to right starting with the number 1 (one) and corresponding to the welding head number.

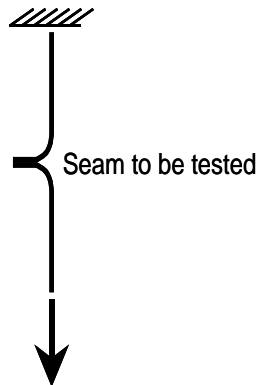


Figure B1

The samples shall air cool for a minimum of 30 minutes. Randomly choose 10 welds from samples "A" and "B" and cut those welds from the geocell samples such that 4 in (10 cm) of material exist on each side of the weld. These samples shall be cut to a width of 4 in (10 cm). Properly identify each weld using the sample letter and weld seam number.

These samples are now ready to be tested.

Long-term Seam Peel Strength Test

The long-term seam peel strength test shall take place within an environmentally controlled chamber that undergoes temperature change on a 1-hour cycle from room temperature to 130°F (54°C). Room temperature shall be defined per ASTM E41.

Within the environmentally controlled chamber, one of the ends of the samples (10 samples in total) shall be secured to a stationary upper clamp. The jaws of the clamp shall be of such configuration that the grip does not over stress the sample during the test period. The sample shall be secured so that its axis is vertical and the welds being tested are horizontal as the sample hangs within the environmentally controlled chamber.

A weight of 160 lb (72.5 kg) shall be lifted via a hoist or lift platform and attached to the free lower end, of the sample. The weight shall be lowered in a way so that no impact load occurs on the sample being tested. The weight shall be sufficient distance from the floor of the chamber so that the weight will not touch the floor of the chamber as the sample undergoes creep during the test period. The date and hour the weight is applied shall be recorded.

The temperature cycle shall commence immediately within the environmentally controlled chamber. The test period for the applied load shall be 168 hours.

Definition of Pass / Failure

If any of the 10 seams fail prior to the end of the 168-hour (7-day) period, the date and hour of the failure shall be recorded and the polyethylene resin and strip material shall be considered unsuitable for geocell manufacturing.

**SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS**

END OF SECTION

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

SECTION 02505

**GRANULAR PAVING
(ACCESS ROADS, PARKING AREAS, AND WALKWAYS)**

TABLE OF CONTENTS

GENERAL

1.1 GENERAL

PRODUCTS

2.1 MATERIALS

2.2 AGGREGATE MATERIAL

2.3 Not Used

2.4 SOIL STERILANT

EXECUTION

3.1 PREPARATION OF GROUND SURFACE

3.2 SURFACING

3.3 PLACEMENT OF ROAD STABILIZING/WEED CONTROL FABRIC

3.4 AGGREGATE PLACING

3.5 COMPACTION AND GRADING

3.6 PLACEMENT OF SOIL STERILANT

3.7 QUALITY ASSURANCE

3.7.1 Testing

3.7.2 Certification

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

SECTION 02505

**GRANULAR PAVING
(ACCESS ROADS, PARKING AREAS, AND WALKWAYS)**

PART 1 GENERAL

1.1 GENERAL

The contractor shall provide the necessary materials, labor and equipment for the construction of access roads and walkways as specified herein or on applicable drawings.

No herbicides will be applied to any areas within any wetlands areas.

PART 2 PRODUCTS

2.1 MATERIALS

The contractor shall furnish materials for access roads and walkways, and for patching the road(s) and runway/taxiway areas that meet or exceed the requirements specified herein and as shown on the drawings.

2.2 AGGREGATE MATERIAL

Unless otherwise indicated, areas designated to be crushed rock shall be at least 4 inches deep and have a maximum aggregate size of 3/4 inch and be dense graded and approved by the FAA.

Road Base material shall meet State DOT Class 1, 5, or 6 requirements. Other gradation limits are as follows:

<u>SIEVE #</u>	<u>CLASS 1</u>	<u>% PASSING BY WEIGHT</u>	
		<u>CLASS 5</u>	<u>CLASS 6</u>
2 1/2"	100	----	----
2"	95-100	----	----
1 1/2"	----	100	----
1"	----	95-100	----
3/4"	----	----	100
#4	30-65	30-70	30-65
#8	----	----	25-55
#200	3-15	3-15	3-12

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER RELOCATIONS

The material shall be clean and well graded. All aggregate material shall be approved by the Resident Engineer before placement.

2.3 Not Used.

2.4 SOIL STERILANT

Use water-soluble liquid herbicide such as Hyvar X-L by Dupont (or approved equal). Active ingredient: Lithium salt of bromacil - 21.9%.

PART 3 EXECUTION

3.1 PREPARATION OF GROUND SURFACE

Areas designated for access roads, walkways, and graveled areas shall be scarified to a depth of 4" (unless otherwise specified) and compacted to 95 percent of maximum dry density in accordance with AASHTO-T99.

3.2 SURFACING

Surfacing shall only be done when the ground surface is dry and unfrozen. Placement shall be made to the line and grade shown on the applicable drawings and as staked by the contractor. Compaction shall be performed with a steel wheel tandem or 3-wheel roller not weighing less than eight tons or a method satisfactory to the Resident Engineer.

3.3 PLACEMENT OF ROAD STABILIZING/WEED CONTROL FABRIC

The fabric shall be installed on the prepared subgrade rolled out directly upon the prepared surface and shall not be dragged over any surface. Fabric in place shall have a smooth surface and shall be free of folds, wrinkles, cuts, or other imperfections. Individual panels of fabric shall be overlapped 18 inches minimum with the preceding layer overlapping the following layer in the direction that surfacing material will be spread. No vehicular traffic will be permitted directly upon the fabric.

3.4 AGGREGATE PLACING

Aggregate surfaced roads, walkways, parking areas, and turn around areas, shall consist of a minimum of 4 inches deep compacted crushed rock (3/4" max aggregate) unless otherwise shown on the Project Drawings. Aggregate shall be compacted by roller.

3.5 COMPACTION AND GRADING

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER RELOCATIONS

Compaction shall closely follow the spreading operation to prevent loss of contained moisture or displacement of materials. Any irregularities or depressions that develop in the layers under rolling operations shall be corrected by loosening the material and removing or adding aggregate and re-rolling. The rolling shall be continued until the surface is shown to be smooth and uniform, and to such trueness that when tested with a 10-foot straightedge it shall not show any deviation in excess of 1/4-inch. At all places not accessible to the roller, the aggregate of each layer shall be tamped separately and compacted to grade and line with mechanical tampers.

If any subgrade material is worked into the aggregate material during the compacting or finishing operations, all granular material within the affected areas shall be removed and replaced with new aggregate. The Resident Engineer may restrict hauling or traffic over the completed or partially completed base after inclement weather or at any time when the subgrade is soft, and there is a tendency for the subgrade material to work into the base material.

Compaction requirements are 95 percent maximum dry density as determined by AASHTO T 180. Compaction shall continue until no further discernible compaction is evidenced under action of the compaction equipment.

3.6 PLACEMENT OF SOIL STERILANT

Water-soil liquid soil sterilant (herbicide) shall be applied to all finished roads, walkways, parking areas, and areas where crushed rock was installed. Apply herbicide per the manufacture's instructions.

3.7 QUALITY ASSURANCE

3.7.1 Testing

Compaction testing shall be arranged by the contractor and performed by an independent testing company (in the presence of the Resident Engineer) at the expense of the contractor. If these tests show that the compaction is less than specified, the contractor shall correct the situation and be responsible for all associated cost.

3.7.2 Certification

The contractor shall furnish a certificate that all materials, compositions, densities and mixtures to be used in the construction of access roads and walkways meet local or state requirements. The contractor shall provide the Resident Engineer, at the time of delivery, two copies of the aggregate delivery ticket or bituminous concrete delivery ticket. The tickets shall indicate the delivery date, time dispatched, name and location of the project, name of contractor, name of supplier, truck number, quantity and composition of job mix formula.

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

END OF SECTION

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

SECTION 02930

SEEDING

TABLE OF CONTENTS

GENERAL

1.1 GENERAL

PRODUCTS

2.1 FERTILIZER

2.2 SEED

EXECUTION

3.1 PREPARATION OF GROUND & SEEDING

3.2 MAINTENANCE AND REPAIR

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

SECTION 02930

SEEDING

PART 1 GENERAL

1.1 GENERAL

All seeded areas disturbed by the contractor shall be restored to its original condition. The work covered by this section consists of furnishing all labor, materials, tools, equipment, plant and services necessary to complete the portion of site work including topsoil placement, sodding and planting specified herein and as shown on the applicable drawings.

PART 2 PRODUCTS

2.1 FERTILIZER

A commercial fertilizer, uniform in composition, free flowing and suitable for spreading with approved equipment shall be used. Fertilizer shall be not less than 40 pounds nitrogen and 40 pounds phosphorus per acre.

2.2 SEED

New seed shall be applied so that the resulting growth results in a turf that matches the undisturbed surrounding areas. The exact seeding mixture shall be obtained from and approved by the Resident Engineer.

PART 3 EXECUTION

3.1 PREPARATION OF GROUND & SEEDING

Areas to be seeded shall be raked or otherwise cleared of stones larger than 3" in diameter, sticks, and other debris which might interfere with sowing of seed and growth of grasses. Following preparation, fertilizer shall be uniformly spread over the entire area to be seeded. Immediately after fertilizing the seed shall be sown at the specified rate and the seed shall be raked in 1/2 to 3/4 inch.

3.2 MAINTENANCE AND REPAIR

The contractor shall maintain seeded and sodded areas until the Contractor Acceptance Inspection. Maintenance shall consist of watering and mowing operations and protecting such areas from traffic. Repair shall consist of reestablishing seed or sod areas damaged by traffic, erosion, drought, fire, or water. Such areas shall be re-sodded or re-seeded in accordance with this specification or as directed by the Resident Engineer until a satisfactory growth is obtained.

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

END OF SECTION

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

DIVISION 3 CONCRETE

SECTION 03100

CONCRETE FORMWORK

TABLE OF CONTENTS

GENERAL

1.1 GENERAL

PRODUCTS

2.1 FORMS
2.2 CYLINDRICAL CONCRETE PIERS
2.3 FORM TIES
2.4 FORM OIL

EXECUTION

3.1 FORM WORK PLACEMENT
3.2 FORM CURING
3.3 FORM REMOVAL

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND
BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER
RELOCATIONS

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.1 GENERAL

The contractor shall provide all labor, equipment and materials as required to locate and place concrete forms specified herein or on applicable drawings.

PART 2 PRODUCTS

2.1 FORMS

Forms shall be wood, plywood, metal or other approved material. The contractor may use prefabricated forms for cylindrical foundations if indicated on the applicable drawings. All form materials shall be of the grade or type suitable to obtain the kind of finish specified.

2.2 CYLINDRICAL CONCRETE PIERS

All cylindrical concrete piers, if required, shall be formed to a depth of two feet minimum. Use approved cylindrical forms.

2.3 FORM TIES

Form ties shall be either fixed band type or threaded internal disconnecting type with a working load suitable to prevent deformation of forms. They shall be of the type as to leave no metal closer to the surface than 1/2 inches for steel ties and 1 inch for stainless steel ties. Twisted wire ties shall not be permitted.

2.4 FORM OIL

Form oil shall be nonstaining and shall not cause softening of the concrete or impede the wetting of surfaces to be cured with water or curing compounds.

PART 3 EXECUTION

3.1 FORMWORK PLACEMENT

SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C and 16L AND BELLINGHAM INTERATIOAL AIRPORT RUNWAY 16 (LOCALIZER RELOCATIONS

Formwork shall not be placed prior to inspection, testing or approval of the excavated area and imbedded items by the Resident Engineer. Forms shall result in a final structure which does not exceed +1/2 inch variation in any dimension shown on the applicable drawings. Form joints shall be sufficiently tight to prevent leakage of mortar. Form oils shall be placed on forms or form ties and shall be removed from reinforcing steel or conduits if accidentally applied to such.

3.2 FORM CURING

In hot, dry climates, wood forms remaining in place shall not be considered adequate curing, but shall be loosened so that the concrete surfaces may be cured in accordance with 3-3.6.

3.3 FORM REMOVAL

Forms shall not be removed until concrete has attained at least 30 percent of the specified 28-day compressive strength.

END OF SECTION

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 03200

CONCRETE REINFORCEMENT

TABLE OF CONTENTS

GENERAL

- 1.1 GENERAL
- 1.2 REFERENCES
- 1.2.1 American Society for Testing and Materials (ASTM)
- 1.2.2 American Concrete Institute (ACI) Standards

PRODUCTS

- 2.1 REINFORCING STEEL
- 2.2 TIE WIRE, CHAIRS, AND SPACERS

EXECUTION

- 3.1 REINFORCEMENT SURFACES
- 3.2 BENDING
- 3.3 HOOKS
- 3.4 PLACING REINFORCEMENT
- 3.5 QUALITY ASSURANCE

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 GENERAL

The contractor shall provide the necessary labor, materials and equipment for the placement of steel reinforcement as specified herein and shown on the applicable drawings.

1.2 REFERENCES

The following specifications and standards of the issues currently in force, form a part of this section and are applicable as specified herein.

1.2.1 American Society for Testing and Materials (ASTM)

ASTM A 615 - Deformed Billets Steel Bars for Conc. Reinforcement

ASTM A 185 - Welded Wire Fabric for Concrete Reinforcement

1.2.2 American Concrete Institute (ACI) Standards

ACI 315 - Manual of Engineering and Placing Drawings for Reinforced Concrete Structures

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

PART 2 PRODUCTS

2.1 REINFORCING STEEL

Reinforcing steel shall be new, clean, undamaged, and unless otherwise indicated, conforming to ASTM A-615, grade 60.

2.2 TIE WIRE, CHAIRS, AND SPACERS

All devices necessary to properly space, support and fasten steel reinforcement in place during concrete placement shall conform to ACI 315. Tie wire shall be 16 gauge or larger annealed iron wire.

PART 3 EXECUTION

3.1 REINFORCEMENT SURFACES

Steel reinforcement shall be free of mud, oil or other nonmetallic coatings which may affect bonding quality. Mill scale or rust remaining after hand brushing with a wire brush is permissible.

3.2 BENDING

All bends in bars and ties shall be cold bent. No bends shall be made in bars or ties partially embedded in concrete.

3.3 HOOKS

Hooks indicated shall be 180 degree hooks. The bend diameter as measured on the inside of the bar shall be not less than 6 bar diameters for bars and not less than 1-1/2 inches for #3 ties.

3.4 PLACING REINFORCEMENT

Steel reinforcement shall be accurately placed at the spacing and in the sizes indicated on the applicable drawings and secured against displacement during the pour operations. Reinforcement shall be placed within +1/2 inch of the indicated dimensions.

3.5 QUALITY ASSURANCE

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

Two copies of mill certificates of steel compliance with ASTM A 615 shall be submitted to the Resident Engineer at the time of site delivery. The certificate shall be signed by an authorized officer of the contractor, and shall include the project name and location, and the quantity and delivery date to which the certificate applies.

END OF SECTION

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 03300

CAST-IN-PLACE CONCRETE

TABLE OF CONTENTS

GENERAL

- 1.1 GENERAL
- 1.2 REFERENCES
 - 1.2.1 American Society for Testing and Materials (ASTM)
 - 1.2.2 American Concrete Institute (ACI) Specification
- 1.3 SUBMITTALS

PRODUCTS

- 2.1 CEMENT
- 2.2 AGGREGATES
- 2.3 WATER
- 2.4 ADMIXTURES
- 2.5 QUALITY
 - 2.5.1 Slump
 - 2.5.2 Strength
 - 2.5.3 Air Content
 - 2.5.4 Proportions
- 2.6 EXPANSION JOINT FILLER
- 2.7 EXPANSION JOINT SEALANT

EXECUTION

- 3.1 MIXING AND PLACING CONCRETE
 - 3.1.1 Site Preparation
 - 3.1.2 Mixing
 - 3.1.3 Conveying
 - 3.1.4 Depositing
 - 3.1.5 Cylindrical Concrete Piers
 - 3.1.6 Consolidation
 - 3.1.7 Finish
- 3.2 CURING
- 3.3 ANCHOR BOLTS, PLATES, AND COUPLINGS

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 3.3.1 Anchor Bolts and Plates
- 3.3.2 Embedded Couplings
- 3.4 QUALITY ASSURANCE
 - 3.4.1 Testing
 - 3.4.2 Concrete Certification
- 3.5 REPAIR AND REPLACEMENT

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 GENERAL

The contractor shall provide the necessary materials, labor and equipment for the placement of concrete as specified herein and shown on applicable drawings.

1.2 REFERENCES

The following specifications and standards of the issues currently in force, form a part of this section and are applicable as specified herein.

1.2.1 American Society for Testing and Materials (ASTM) Specifications

ASTM C 33 Specifications for Concrete Aggregates
ASTM C 94 Specifications for Ready-Mixed Concrete
ASTM C 143 Slump of Portland Cement Concrete
ASTM C 150 Specification for Portland Cement
ASTM C 231 Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260 Specification for Air-Entraining Admixtures for Concrete
ASTM C 494 Specification for Chemical Admixtures for Concrete

1.2.2 American Concrete Institute (ACI) Specification

ACI 211.1 - Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete

1.3 SUBMITTALS

Provide certification signed by material producer and contractor that all materials and mix compositions comply with the specified requirements.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

PART 2 PRODUCTS

2.1 CEMENT

All cement shall conform to ASTM C 150, Type I or Type III as indicated on the drawings.

2.2 AGGREGATES

Aggregate shall conform to ASTM C 33 except that maximum aggregate size shall be 3/4-inch.

2.3 WATER

Water used in mixing and curing operations shall be clean, and free from oils, acids, organic matter and chemical suspensions which may adversely affect cure times, strength requirements or service life of the concrete.

2.4 ADMIXTURES

Air entraining admixtures shall conform to ASTM C 260. Admixtures used for water-reducing and retarding shall conform to ASTM C 494, Type A or Type D.

2.5 QUALITY

2.5.1 Slump

The concrete shall have a slump of 3 to 4 inches.

2.5.2 Strength

Unless otherwise indicated on the construction drawings, Type I concrete shall have a 28 day compressive strength of 4,000 psi and Type III shall have a 7 day compressive strength of 4,000 psi.

2.5.3 Air Content

Air entraining for all concrete shall be 4 to 8 percent.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

2.5.4 Proportions

Concrete materials shall be proportioned in accordance with ACI 211.1 for site mixed concrete and ASTM C 94 for ready mixed concrete.

2.6 EXPANSION JOINT FILLER

Use flexible foam expansion joint filler such as Ceramar by W.R. Meadows, Inc. (or approved equal). Product shall meet the requirements of ASTM D 1752, Sections 5.1 through 5.4 with the compression requirement modified to 10 psi minimum and 25 psi maximum and shall be compatible with hot-pour joint sealers.

2.7 EXPANSION JOINT SEALANT

Use one-part self-leveling polyurethane sealant such as Sonolastic SL1 by Sonneborn (or approved equal). Product shall comply with Federal Specification TT-S-00230C, Type 1 Class A; ASTM C 920, Type S, Grade P, Class 25, Use T, M.

PART 3 EXECUTION

3.1 MIXING AND PLACING CONCRETE

3.1.1 Site Preparation

Prior to placing concrete all areas to receive concrete shall be inspected and approved by the Resident Engineer. Concrete shall not be deposited on muddy or frozen material. All surfaces to be in contact with the concrete shall be wetted.

3.1.2 Mixing

All mixers used for ready mix or site mix operations shall be cleaned prior to material recharge. The area of operation of the mixers shall be such as to not endanger existing structures or excavations. All concrete shall be mixed until there is a uniform distribution of materials. Concrete having attained initial set or having contained water for more than 90 minutes shall not be used in the work.

3.1.3 Conveying

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

Concrete shall be conveyed from the mixer to the deposit site by equipment which will prevent separation or loss of material and which will ensure a nearly continuous flow of material at the deposit site.

3.1.4 Depositing

Concrete shall be placed in such a manner as to prevent displacement of forms or reinforcement. Placing shall be stopped if contamination due to sloughing occurs until the contaminant can be removed. In the case of form or reinforcement displacement, placing may be continued only if the displacement is corrected within specified tolerances. The placing of concrete shall be a continuous operation at each deposit site and shall be completed within 1-1/2 hours after the addition of water. Concrete shall be deposited in 12 to 18 inch layers as level as possible prior to consolidation operations. Under no circumstances shall fresh concrete be placed over concrete that is no longer plastic. Time between placements at each deposit site shall not exceed one hour for regular mixes and two hours for retarded mixes.

3.1.5 Cylindrical Concrete Piers

Tops of piers shall be furnished flat within the confines of the Sonotube forms. Unless otherwise approved, the edges shall have a 1/2" or 3/4" radius. No spillage (mushrooming) over the tops of forms will be allowed.

3.1.6 Consolidation

Consolidation of concrete during and after placing shall be performed using an internal vibrator with a vibration frequency not less than 150 hertz. Each layer shall be consolidated so that concrete is thoroughly worked around reinforcement, embedded items and forms. Vibrators shall penetrate about 6 inches into underlying layers to ensure proper union of the layers. Movement of the vibrator over the layer shall be such as to ensure uniform plasticity without pooling of cement.

3.1.7 Finish

After the concrete has been placed and consolidated, the surface shall be screed with straight edges, floated, and troweled to the required finish level. All concrete surfaces shall have a smooth finish except for exposed top surfaces which shall have a broom finish. Broom lines shall be straight and parallel to the form edges and well defined. Unless otherwise indicated on the drawings, the foundation surface shall be level +/- 1/8" and all exposed edges shall be

**SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF**

chamfered 1 inch (1/2" or 3/4" radius on circular tops). A NEAT, CLEAN, PROFESSIONAL CONCRETE FINISH IS REQUIRED! Concrete not meeting this requirement shall be completely removed and replaced at the contractor's expense.

Apply a Concrete Curing Compound (SealMaster or as approved) as directed by the manufacturer and as approved. Concrete Curing Compound should generally be applied once the concrete is firm enough to walk on with no surface water present (about one hour after final trowelling or when application will not mar surface).

3.2 CURING

Concrete shall be maintained above 50 degrees F and less than 120 degrees F and in a moist condition during the cure period. The cure period shall be 7 days when Type I Portland cement is used and 3 days when Type III Portland cement is used. Exposed surfaces shall be covered with burlap, cotton, or other approved fabric or sand. If air temperatures are expected to exceed 75 degrees F, water curing shall be continuous and forms shall be loosened as soon as the concrete has set sufficiently to prevent damage. In conditions where air temperature may be expected to fall below 40 degrees F, equipment and covering to maintain a 50 degree concrete temperature shall be provided. Salt or other chemicals to prevent freezing shall not be permitted.

3.3 ANCHOR BOLTS, PLATES, AND COUPLINGS

3.3.1 Anchor Bolts and Plates

Anchor bolts shall be installed in concrete prior to the concrete setting and at a time and manner to assure that there is no voids around the bolts. Anchor bolts and plates shall be set level and plumb, and within a tolerance necessary for their proper alignment and to the structure support. Flanges and anchors shall be set level and plumb, and within a tolerance necessary for their proper alignment and to the frangible structure they support. All bolts and other hardware shall be hot-dipped galvanized and shall be contractor furnished (unless otherwise indicated to be government furnished).

3.3.2 Embedded Couplings

Couplings embedded in concrete shall be installed so that the top of the coupling is flush with the top of concrete and conduits to be extended from the coupling are level and plumb. Foundations with embedded couplings that do not meet this requirement shall be removed and re-installed at the contractors expense.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

3.4 QUALITY ASSURANCE

3.4.1 Testing

Testing for the concrete shall be arranged by the contractor and performed by an independent testing company (in the presence of the Resident Engineer) at the expense of the contractor. If these tests show concrete strength less than specified, the contractor shall correct the situation and be responsible for all associated cost.

3.4.2 Certification

The contractor shall furnish a certificate that all materials, compositions, densities and mixtures to be used meet local or state requirements. The contractor shall provide the Resident Engineer with a delivery ticket (batch ticket) for ready mix concrete from the concrete supplier at the time of each delivery which certifies compliance with material and quality requirements specified herein. The tickets shall indicate the delivery date, time dispatched, name and location of project, name of contractor, name of concrete producer, truck number, quantity, air content, admixtures and design strength of the concrete delivered.

3.5 REPAIR OR REPLACEMENT

The contractor shall restore concrete damaged by work under this contract to its original condition as directed by the Resident Engineer. The Resident Engineer shall reject any fresh concrete not meeting slump or air entrainment requirements. Any concrete not meeting strength requirements shall be removed and replaced by the contractor. Any repair or replacement costs shall be paid by the contractor.

END OF SECTION

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

DIVISION 5 STRUCTURAL STEEL

16000 ELECTRICAL

ELECTRICAL

TABLE OF CONTENTS

GENERAL

- 1.1 GENERAL
- 1.1.1 Workmanship
- 1.1.2 Interpretation of Drawings
- 1.1.3 Rules
- 1.1.4 Coordination
- 1.2 REFERENCES
- 1.2.1 National Fire Protection Association (NFPA) Publications
- 1.2.2 F.A.A. Specifications and Standards

PRODUCTS

Not Used

EXECUTION

Not Used

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

DIVISION 16000

ELECTRICAL

PART 1 GENERAL

1.1 GENERAL

This section covers the requirements for electrical work complete. The work covered under this section consists of furnishing all labor, tools, equipment and material to install the electrical work shown on the drawings and/or described by these specifications.

1.1.1 Workmanship

All electrical installation work shall be performed by experienced electricians regularly engaged in this type of work and properly licensed when required. All materials and equipment shall be installed in conformance with the contract documents, and in accordance with recommendations of the manufacturer as approved by the Resident Engineer.

1.1.2 Interpretation of Drawings

In general, the drawings utilize accepted diagrammatic symbolism to indicate electrical construction work. This symbol does not have any dimensional significance. The layout of wiring, circuits, outlets, and equipment is developed as an engineering aid and should not be interpreted as a release from responsibility for installing the work without space conflict, but all work shall be installed in accordance with the diagrammatic intent of the drawings.

1.1.3 Rules

The installation shall conform to this specification, the contract drawings and to the applicable requirements of the National Electrical Code, local code, or FAA standards. In cases where regulations and/or contract documents are conflicting or discrepancies occur, the more stringent requirement shall be followed and enforced.

1.1.4 Coordination

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

It is the responsibility of the contractor to totally familiarize himself/herself with the scope of the work involved and to coordinate his work with the other trades and personnel involved with the job site.

1.2 REFERENCES

The issues currently in force of the following specifications and standards form a part of this section, and are applicable as specified herein:

1.2.1 National Fire Protection Association (NFPA) Publications

No. 70 National Electrical Code

No. 78 Lightning Protection Code

1.2.2 FAA Specifications and Standards

UNLESS OTHERWISE INDICATED, THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING FAA SPECIFICATIONS AND STANDARDS:

FAA-C-1217f Electrical Work, Interior

FAA-C-1391b Installation and Splicing of Underground Cables

FAA-STD-019e Lightning and Surge Protection, Grounding, Bonding and Shielding
Requirements for Facilities and Electronic Equipment.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

CONTRACTORS SHALL IMMEDIATELY NOTIFY THE FAA OF ANY CONFLICTS THAT EXIST WITHIN THE CONTRACT DOCUMENTS AND BETWEEN THOSE DOCUMENTS AND THE RULES, REGULATIONS AND CODES OF THE LOCAL UTILITY COMPANY AND LOCAL COUNTY OR STATE GOVERNING BODIES. IN CASES WHERE REGULATIONS AND/OR CONTRACT DOCUMENTS ARE CONFLICTING OR

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

DISCREPANCIES OCCUR, THE MORE STRINGENT REQUIREMENT SHALL BE
FOLLOWED AND ENFORCED.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 16100

ELECTRICAL INSTALLATION

1.0 GENERAL REQUIREMENTS

1.1 Scope - The Contractor must furnish all labor, equipment and materials, except GFM, required to complete the project as shown on the plans.

1.2 Utility Service and Interruption of Service – **Contact the COTR to coordinate any outages for power and equipment connections.** The FAA and airport operations in the vicinity of this project provide aircraft flight control and assistance information which is required for safety of the aircraft and the public. Therefore, any power loss to facility equipment is very serious and must be carefully coordinated with facility personnel via the COTR. Unscheduled interruptions of electrical service to FAA facilities or equipment may be a cause aircraft accidents and loss of life. Work requiring a temporary or permanent de-energization of equipment must be scheduled in writing with the onsite FAA maintenance personnel. Only onsite FAA maintenance personnel are authorized to energize, de-energize equipment or to operate a circuit breaker, switch or fuse in a FAA facility. Determine all interface requirements and provide material and labor needed to complete any connections to be scheduled during an outage. Work procedures must include lock-out/tag-out procedures in accordance with FAA order 3900.49.

1.3 Applicable Documents - The current issues of the following documents in effect on the date of the invitation for bids form a part of this specification and are applicable to the extent specified herein.

1.3.1 Federal Specifications -

J-C-30	Cable and Wire, Electrical (Power, Fixed Installation)
W-C-375	Circuit Breakers, Molded Case; Branch Circuit and Service
WW-C-566	Conduit, Metal, Flexible
QQ-W-343	Wire, Electrical, (Uninsulated)

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 1.3.2 National Fire Protection Association (NFPA) Publications -
No. 70 National Electrical Code (2005 Edition)
- 1.3.3 National Electrical Manufacturers Association (NEMA) Standards -
WC 5 Thermoplastic Insulated Wire and cable for the transmission and
distribution of electrical energy.
WD 1 General Purpose Wiring Devices
- 1.3.4 Underwriters' Laboratories, Inc. (UL) Standards -
UL 6 Rigid Metal Conduit
UL 486c Splicing Wire Connectors
UL 514b Fittings for Conduit & Outlet Boxes
UL 651 Schedule 40 and 80 Rigid PVC Conduit
UL 797 Electrical Metallic Tubing
- 1.3.5 FAA Standards -
FAA-C-1217f Electrical Work, Interior
FAA-C-1391b Installation and Splicing of Underground Cables
FAA-STD-019e Lightning Protection, Grounding, Bonding, and Shielding
Requirements for Facilities
FAA-E-2072b Cable, Telephone, Exterior
- (Copies of Federal Specifications are available from the General Services
Administration (GSA) Business Service Center, 915 2nd Avenue, Seattle, WA,
phone 442-5556.)
- 1.3.6 Codes - The installation must conform to this specification and to the applicable
rules of FAA standards, the National Electrical Code or local code, whichever
requires the highest quality of material and workmanship. The following
specifications and standards of the issues currently in force, form a part of this
section, and are applicable to this contract. All electrical work must be in
compliance with the current edition of: NFPA 70 National Electric Code, FAA C-
1217-f, and FAA-STD-019e.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

2.0 MATERIALS

2.1 General - The Contractor must furnish all materials not specifically shown as GFM to complete the work. Materials and equipment must comply with all contract requirements. Materials to be furnished by the Contractor under this specification must be new, the standard products of manufacturers regularly engaged in the production of such materials, and of the manufacturer's latest designs. All materials for installation in wet locations must be listed and labeled by the Underwriters Laboratory (UL) as suitable for wet locations. All other materials provided by the Contractor must bear the label of UL if the materials are normally evaluated and labeled by UL. All materials and construction methods must be in compliance with FAA-C-1217f and FAA-STD-019e.

2.2 Conductors -

2.2.1 Uninsulated Conductors must be copper and must only be used where specifically identified within the contract drawings. Uninsulated conductors must comply with Federal Specifications QQ-W-343. Conductors #6 AWG and smaller must be solid and conductors #4 and larger must be stranded.

2.2.2 Insulated Conductors must be copper in accordance with Federal Specifications J-C-30.

2.2.3 Size and Type Conductors - Unless indicated otherwise on the contract drawings, all conductors must be soft drawn copper with thermoplastic or thermosetting insulation type THWN, and XHHW for general use. Control wire must be stranded. The minimum size wire, except for control wiring, must be No. 12 AWG. Control wire must be no smaller than No. 14 AWG unless specifically allowed otherwise. Power conductors No.10 AWG and smaller must be solid, No.8 AWG and larger must be stranded. All temperature limitations for conductors must be met per NEC 110-14C and table 310-16.

2.2.4 Control Cables - Control Cables must be copper shielded, insulated, and jacketed in accordance with Specification FAA-E-2072b. Minimum control wire size must be #12 stranded unless noted otherwise.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 2.2.5 Wire Delivery - Wire and cable must be delivered to the project site in original boxes and factory reels. Insulation must have repetitive markings stating the manufacturer, size, type of insulation, etc.
- 2.3 Conductor Splices, Terminations, and Connectors - Federal Specification W-S-610: Splices in stranded wire, and wire No. 8 and larger, must be made with compression connectors. Splices in Wire No. 10 and smaller (solid) must be made with mechanical connectors. In either case, the splice must be made both mechanically and electrically secure. Comply with paragraph 110-14 (a) of the National Electrical Code. If the connector is not insulated, the splice must be half wrapped with electrical plastic tape until the thickness is twice the thickness of the original insulation. All splices must be made at accessible junction and outlet boxes. All splices, including those made with insulated wire nuts, must be insulated with electrical tape or shrink tubing to an insulation value level equal to or greater than that of the factory insulated conductors. Insulated wire nuts must be taped for mechanical integrity. In cases where more than one cable must terminate at the same connection point, either two wire lugs must be installed back to back if there is room for this configuration, or a special terminal must be used with multiple barrels provided for multiple cable terminations. Two or more cables are not allowed to terminate with one single lug designed for only one single termination.
- 2.4 Tape - Friction Tape - Federal Specification HH-I-510.
Plastic Tape - Federal Specification HH-I-595.
Rubber Tape - Federal Specification HH-I-553.
- 2.5 Conduit - Conduit must be of the types and size indicated on the applicable drawings. Galvanized rigid steel (GRS) conduit must conform to the requirements of UL 514b. Rigid nonmetallic conduit must be schedule 40 PVC and conform to UL 651. Flexible metallic conduit must conform to Federal Specification WW-C-566. Conduit terminations must include insulated bushings. Conduits shall be sized as shown in the drawings.
- 2.6 Boxes - Boxes installed in wet locations or exterior boxes must be the cast metal hub type and conform to NEMA 3R type. Interior boxes can be one piece

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

galvanized steel type. Boxes for metallic raceways must be of cast-metal threaded hub type. Where not sized on the drawings, boxes must be sized in accordance with the NEC.

- 2.7 Circuit Breakers - All circuit breakers must be UL listed thermal magnetic type and meet federal specification W-C-375. Circuit breakers must also have trip ratings, AIC ratings, voltage ratings, and number of poles as defined on the drawings. If circuit breaker information is not provided and the circuit breaker is being added to an existing panel, the circuit breaker must match, in manufacture and type, the existing breakers within the panel. All circuit breakers must have a trip indicating feature. Single pole breakers must be full-size modules. Multi-pole circuit breakers must have an internal common trip mechanism. Circuit breakers must be bolt on type, plug in type circuit breakers must not be allowed except when specifically identified.
- 2.8 Safety Switches - Safety switches must conform to Federal Specification W-S-865, and must be type heavy duty "HD". Switches installed outdoors, or in damp or wet locations, must be mounted in NEMA 4 enclosures. Switches must be of the voltage and current ratings indicated on the drawings, and each must be capable of interrupting ten (10) times the full rated load current. The switches must be of the quick-make, quick-break type, and all parts must be mounted on insulating bases to permit replacement of any part from the front of the switch. All current carrying parts must be of high-conductivity copper, designed to carry a rated load without excessive heating. Switch contacts must be silver-tungsten type or plated to prevent corrosion, pitting and oxidation, and to assure suitable conductivity. Switches must have rejection fuse blocks to prevent replacement by lower rated fuses and must be capable of being locked in the On and Off positions.
- 2.8.1 Fuses - A complete set of fuses must be installed and one set of spares must be furnished for each fusible device. Fuses must have a voltage rating not less than the circuit voltage. Unless indicated otherwise, service entrance fuses must be class RK5 and feeder and branch fuses must be class RK1.
- 2.9 Equipment Identification - Each of the following types of equipment must be identified with a nameplate which shows: the functional name of the unit, voltage

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

utilized, single or three phase as applicable, the panel and circuit number powering the equipment, and any other pertinent information. Switches for local lighting do not need to be identified.

- a. Panelboards
- b. Disconnect Switches (fused or non-fused)
- c. Surge Arrestors
- d. Transformers
- e. Self Enclosed Circuit Breakers
- f. Electrical Boxes

Nameplates must be non-ferrous metals or rigid plastic, stamped, embossed, or engraved with 3/8-inch minimum height lettering and numerals. The plates must be secured to the equipment with a minimum of two screws.

- 2.10 Cable Tags must be circular, not less than two inches in diameter. Cable tags must be copper, plastic, or lead. Copper must not be less than .020 inches thick and lead or plastic must not be less than 0.0625 inches thick. Printed letters not less than 1/4 inch must be stamped into the tag. One-eighth inch nylon cord must be used to attach the tag to the cable. The tag marking must consist of the three letter facility identifier, facility type identification (MALSR, REIL, PAPI), the letter identifying the cable identification (MALSR, REIL, PAPI), the letter identifying the cable ("P" for power "C" for control), and must reflect the initiating and terminating locations of the cable. Coordinate with the COTR for the exact labeling required for this project.
- 2.11 Outdoor Receptacles - Receptacles must conform to UL standard 498, Federal specification W-C-596, and NEC Section 406.8. Receptacles must be duplex, 120V, 20A, with ground fault circuit interruption protection and side wired with two screws at each terminal, UL Group I, Class A. Outlets must be installed in a weatherproof box and have a weatherproof cover over each receptacle. The cover must have spring return doors. The receptacles must be weatherproof whether or not the plug is inserted (per NEC Section 406.8). Receptacles must be mounted a minimum of 2'-0" above finished grade unless otherwise noted. Each outlet box must have a machine screw which fits into a tapped hole in the box for the ground connection. Receptacles must be grounded by the installation of a green pigtail from the ground screw to the lug on the box where the green ground is connected.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 2.12 Cable Splicing –Splices made in light bases and manholes must be made using a splice kit designed for underground splices. Splice kits must be manufactured by Raychem, 3M, or an approved equal. Splice material and methods must be submitted for approval prior to commencing any splicing.
- 2.13 Other Materials - All other materials, not specifically described but required for a complete and proper installation of the work of this Section, must be provided by the Contractor subject to the approval of the Site Representative.
- 2.14 Framing Members – Metal framing to support electrical equipment must be 1-5/8” Unistrut channel P1000 Series or equal. The framing system and hardware must be from one manufacturer. One side of the channel must have a continuous slot with inturned clamping ridges for securing attachments with a hardened toothed slotted spring nut. Nuts and bolts used for frame fabrication and equipment mounting must be electro-galvanized finish. Metal framing shall be 12 GA, low carbon strip steel. Channels and fittings must be hot-dipped galvanized after being roll formed.

3.0 **EXECUTION**

- 3.1 General - The rules, regulations and specifications referenced herein must be considered as minimum requirements for this work. This reference shall govern when conflicts occur between the reference documents and this specification. All materials and equipment must be installed in accordance with the contract drawings and the recommendations of the manufacturer as approved by the COTR. The installation must be accomplished by skilled workmen regularly engaged in this type of work. Workmen must be licensed electricians or apprentices under the direct supervision of a licensed electrician. Work requiring the temporary or permanent de-energization of equipment must be scheduled in writing through the COTR with the onsite FAA maintenance personnel. Only onsite FAA maintenance personnel are authorized to energize/deenergize equipment or to operate a circuit breaker or switch in a FAA facility. All installation practices and materials must conform to FAA-C-1217f, FAA-STD-019e, and FAA-C-1391.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 3.2 Contract Drawings - Where the electrical drawings indicate (diagrammatically or otherwise) the work to be completed and the intended function, the Contractor must furnish all equipment, material, and labor to complete these installations, and accomplish these indicated functions. Further, the Contractor is responsible for taking the necessary actions to ensure that all electrical work is coordinated and compatible with all other project work. Minor departures from exact dimensions shown in electrical plans may be permitted where required to avoid conflict or unnecessary difficulty in placement of a dimensioned item, provided all contract requirements are met. The Contractor must promptly obtain approval from the Site Representative prior to undertaking any such proposed departure.
- 3.3 Cable and Conduit Depths - Cables and conduits for underground installation must be placed at the depths shown on the applicable drawings. If depths are not indicated on the drawings, minimum depth must be as required by the NEC.
- 3.4 Warning Tape - A 4-inch wide, red plastic warning tape, 6 mil minimum thickness, must be continuously imprinted with the appropriate legend and must be located six (6) inches below finish grade and directly above the cable (or as noted on the construction drawings).
- 3.5 Separation - Power and control conductors must not occupy the same conduit. Power conduits must be separated from control conduits by a minimum of 3 inches.
- 3.6 Raceway Installations -
- 3.6.1 General - Panelboards, surge arresters, disconnect switches, etc., must not be used as raceways for conductor routing other than conductors that originate or terminate in these enclosures. Isolated ground conductor will be allowed to traverse these enclosures. Minimum conduit or tubing size is ¾-inch, but may be ½-inch for control wiring. Each run must be complete before conductors are pulled into the conduit and must be swabbed before conductors are installed. All conduit terminations must include insulated bushings. Ends of conduit systems not terminated in boxes or cabinets must be capped. Crushed or deformed raceways

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

must not be installed. All metallic conduit enclosing AC service lines must be terminated using conductive fittings to panelboard, the power meter, and to the service. All buried metallic conduit enclosing signal, control, status and other power lines must be terminated using conductive fittings to facility junction boxes, equipment cabinets, enclosures, or other grounded metal structure.

- 3.6.2 Conduit Installations - The wiring method must consist of insulated copper conductors pulled into rigid metallic conduit, or, where indicated, watertight flexible metallic conduit. Conduit system must be installed and completed before conductors are pulled into the conduit. Each run must be cleaned and swabbed before conductors are installed. Each single phase over current device must have a dedicated neutral conductor and dedicated equipment grounding conductor. Neutral conductors must not be shared among multiple circuits. All conduit terminations must include insulated bushings. Unless otherwise noted on the drawings, conduit installations must run parallel or perpendicular to the building lines in a neat and workmanlike manner. Conduit must be supported as per NEC requirements. All unused conduits must have a pull string/wire installed with a minimum tensile strength of 200lbs. Ten inches minimum slack must be left at each end of the conduit.
- 3.6.3 Field Bends - Field bends must be avoided where possible and where necessary must be made with standard, approved hickies and conduit bending devices.
- 3.6.4 Field Cutting and Threading - All field cut conduits must be square cut and the ends carefully reamed to remove all burrs. Conduit threads must be tapered such that they provide continuity and solidly grounded connections. The use of running threads will not be permitted.
- 3.6.5 Holes and Sleeves - The contractor must provide all holes and sleeves necessary to install conduit and equipment. All required flashing, escutcheon, and sleeves must be contractor furnished.
- 3.6.6 Galvanized Rigid Metallic Conduit – All galvanized rigid metallic conduit must be of Galvanized Rigid Steel (GRS). GRS conduit may be used in all locations. For installation below slab or underground, the conduit must be factory coated with

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

either .008 inch of epoxy resin per Spec. MIL-R-21931, .020 inch of polyvinyl chloride, or must be field wrapped with .01 inch thick pipe wrapping plastic tape designed for this purpose applied with 50% overlap unless otherwise called for on the drawings. Method used requires prior approval by the Contracting Officer's Representative. All fittings for use with rigid steel conduit must be of threaded type of the same material as the conduit. Where conduits enter boxes or cabinets without threaded hubs, grounding type double locknuts plus a phenolic insulated bushing must be used. A grounding bushing with bonding jumper must be used where shown on the drawings.

- 3.6.7 Flexible Steel Conduit, and Liquidtight Flexible Metal Conduit (LFMC) - Flexible steel conduit may be used in applications where permitted by NEC. If Liquidtight Flexible Metal Conduit is required to be longer than six (6) feet in length, the contractor must obtain approval from the Contracting Officer's Representative.
- 3.6.8 Polyvinyl Chloride (PVC or Rigid Nonmetallic) Conduit – PVC must be heavy wall conforming to UL 651. PVC may only be used underground, in concrete, or as a 6" maximum vertical riser above grade or floor surface to connect to metal conduit. Make joints in PVC conduit in compliance with manufacturer's instructions. Make all bends by means of an electrical heating unit approved by the conduit manufacturer where standard elbows and fittings cannot be used. Rigid nonmetallic conduit may be used for lightning protection system conductors and indoors to protect signal-grounding conductors.
- 3.6.9 Cable Installation in Conduit - The Contractor must take all necessary precautions to insure against damaging the insulation and conductor during installation in conduit. A non-petroleum based lubricant approved by Underwriters' Laboratories must be used if necessary to reduce tension during pulling. The cable may be pulled by power winch or by hand. Cable ends must be sealed with cable end sealing caps or a waterproof tape. Where more than one cable is installed in a conduit, all must be pulled at the same time. Control cable must not be installed in the same conduit as power cable. Power and control cables may be installed in separate ducts of the same duct system. Splices must not be pulled into a conduit.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 3.7 Pulling Tension - Cable pulling tension must comply with FAA-C-1391b and/or the cable manufacturer's recommendations. Contractor must provide a proposed method to monitor the tension during installation to avoid damage. The COTR must be notified prior to cable pulling.
- 3.8 Electrical Identification
- 3.8.1 Conductor Identification - All feeder and branch circuits including neutral conductors, must be identified at both ends of the conductor with panel and circuit number indicated. This must be accomplished using shrink embossed labels only unless otherwise approved by the Contracting Officer's Representative. Control conductors must include adhesive wire numbers corresponding to contract drawings if shown or manufacturer drawings. Contractor must provide 'As-Built' control drawings to the site representative upon completion of the project.
- 3.8.2 Name Plates - All Panelboards, Disconnect Switches, Surge Arrestors, Transformers, Self-enclosed circuit breakers, and electrical boxes all require name plates. Additional units of equipment must also be identified if required by the Site Representative. The plates must be secured to the equipment with a minimum of two screws. See section 2.15.
- 3.8.3 Cable Tags - All cables must be tagged in each manhole, handhole, and wireway with not less than two tags per cable, one near each entrance hole. Tags must be installed immediately after cable installation. Tags must be rigid plastic, engraved with 3/8-inch minimum height black lettering and numerals on a white background. The plates must be secured to the conductor within one foot of the entrance hole. The tag marking must consist of the three letter facility identifier, facility type identification (MALSR, REIL, PAPI), the letter identifying the cable ("P" for power "C" for control), and must reflect the initiating and terminating locations of the cable. Coordinate with the COTR for the exact labeling required for this project.
- 3.9 Color Coding - All branch circuit and feeder conductors must be color coded as specified hereinafter. Conductors must be color coded in all pullboxes, junction boxes, accessible raceways, panelboards, outlets, switches and at all terminations

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

to equipment. Conductors in accessible raceways must be coded in such a manner that by removing any cover, the coding will be visible. The color coding must be continuous throughout the facility on each phase conductor to its point of utilization so that the conductor phase connection is readily identifiable in any part of the installation. Conductors 6 AWG and smaller must have color coded insulation. Conductors larger than 6 AWG may be color coded using half-lapped tape for a minimum length of 3 inches. Conductors installed in accessible raceways must be color coded every 3 feet-0 inches. Phase conductors must be color coded in accordance with the standards of the NEC (conductors with white or green insulation may not be reidentified by taping or any other means).

- 3.10 Grounded Conductors - Insulated conductors No.6 AWG and smaller must have white insulation if intended for use as a grounded conductor. Conductors with white insulation must only be used as grounded conductors. Grounded conductors larger than 6 AWG must be identified at their terminations by tape. Shared/common neutrals are not permitted, i.e., each overcurrent device shall have its own separate neutral conductor. Neutral conductor sizes must not be less than the respective feeder or phase conductor sizes.

- 3.10.1 Equipment Grounding Conductors - All metallic non-current carrying parts of electrical equipment must be grounded with an insulated equipment grounding conductors whether or not shown on the drawings. All metallic raceways must be installed in a manner that assures electrical continuity. All connections to equipment to be grounded must be made with a grounding connector specifically intended for that purpose. Bare wire, wrapped around mounting bolts and screws, is not acceptable as a grounding connection. Each overcurrent device must have its own equipment grounding conductor, i.e., a single pole single phase overcurrent device must be supplied with an equipment grounding conductor. See Table 250-122 of the National Electrical Code for minimum size of this conductor if not specifically identified within the contract documents. Bare equipment ground conductors must not be permitted except for exterior use. Where insulation is required it must be green for equipment grounding conductors 6 AWG and smaller. Equipment grounding conductors larger than 6 AWG and equipment grounding conductors in multiconductor cables (any size) must be identified by marking all exposed insulation with green tape.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 3.11 Ground Rings shall be of #4/0 AWG bare copper.
- 3.11.1 Grounding Electrodes - Grounding electrodes must be installed as shown on the contract drawings, at the shelter ground ring and at all manholes. Unless otherwise shown, ground electrodes must be $\frac{3}{4}$ inch diameter by 10 feet copper clad steel ground rods. The top of the grounding electrodes must be a minimum of 12 inches below grade. Separation between electrodes must not be less than ten (10) feet. Electrodes must be interconnected with bare copper conductor of a size not less than #4/0 AWG buried to a minimum of 24-inch depth. If grounding electrodes cannot be vertically installed to their full length, the COTR must be notified and will approve an alternate method of installation. The COTR will supply a form to be completed by the Contractor stating the results.
- 3.11.2 Grounding Connections - All grounding connection points must be cleaned of paint, insulation and other non-conducting materials prior to making the connection. All connections to the equipment to be grounded must be made with a ground connector specifically intended for that purpose. Connecting screws or mounting bolts are not suitable for use as grounding connections. Grounding conductors passing through conduits must be attached to all ground bushings on the conduit and on pull or junction boxes. Connections to ground electrodes and all other underground connections must be exothermic welds.
- 3.12 Wiring Methods -
- 3.12.1 Raceway System - Where conduit has to be cut in the field, it must be cut square using a hand or power hacksaw or approved pipe cutter using cutting knives. The cut ends of the field-cut conduit must be reamed to remove burrs and sharp edges. Where threads have to be cut on conduit, the threads must have the same effective length and must have the same thread dimensions and taper as specified for factory cut threads on conduit. Conduits installed with threads not complying with these requirements must be removed and replaced with conduits which comply. Clean threads of all oil and shavings and apply a cold zinc rich paint to damaged galvanizing.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

3.12.2 Splices – Wherever possible, cable must be run in one piece. The number of splices must be minimized. Splices must be made only at outlets, junction boxes, or accessible raceways. Splices must not be made within panel board enclosures and must not be pulled into a conduit or duct.

3.12.2.1 Power Cables - Splices must be made with solderless connectors conforming to UL 486c. Insulated wire nuts must be used to splice conductors sized #10 AWG and smaller, and compression connectors must be used to splice conductors #8 AWG and larger. Crimp connections must be made using a crimping tool designed to make a complete crimp before the tool releases. All wire nut splices must be taped for mechanical integrity. All splices for conductors larger than #10AWG must be made with insulated heat shrinkable sleeves.

3.12.2.2 Control Cables – Splicing must be done in strict accordance with the splice kit manufacturer's recommendations. Type "D" polyurethane re-enterable encapsulant must be used for encapsulation of the wire bundle and cable core blockage. The grease filling must be completely cleaned from the splice area using a non-reacting, non-residue type solvent. Cable connectors must be crimp or solder type. If crimp connectors are used, they must be installed with a ratchet type tool which requires full compression before it releases. Insulation for connectors may be either factory applied or field taped.

3.13.3 Boxes - Boxes must be provided in the wiring or raceway system for pulling wires, making connections and mounting devices or fixtures. The Contractor must provide junction boxes as necessary to meet NEC requirements regardless of specific identification within the contract documents. Cast metal boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces must have a liquidtight functioning gasket. Boxes and supports shall be fastened with machine screws or welded studs on steel.

3.14 Not used.

4.0 **CONTRACTOR QUALITY CONTROL**

4.1 Tests - All electrical tests must be performed in accordance with Section 16950.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 4.2 Quality Assurance - All Contractor furnished electrical equipment and materials must be labeled by Underwriters' Laboratories, Inc., if the particular material is normally inspected and labeled.
- 4.3 Repair of Existing Work - Electrical work must be carefully laid out in advance. Where cutting, channeling, chasing, or drilling of floors, walls, ceilings, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, it must be carefully completed. Damage to the building or equipment must be repaired by skilled mechanics of the trades involved at no additional cost to the Government.
- 4.4 Submittals required include, but are not necessarily limited to, the following:
- [Electrical enclosures, switches, outlets, cable, conduit, conduit fittings, and breakers.](#)
 - Splicing methods and materials.

END OF SECTION

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

SECTION 16950

ELECTRICAL TESTING

1.0 GENERAL REQUIREMENTS

- 1.1 Scope - The Contractor must provide the instruments, materials and labor necessary to perform electrical tests as specified herein.

2.0 TESTS

- 2.1 General - All tests must be performed in the presence of the Site Representative. The Contractor must keep records of all tests performed. The Contractor must prepare a report of all measurements and submit them to the COTR.
- 2.2 Insulation Resistance Tests - All Government and Contractor furnished conductors must be tested prior to installation. All feeders and branch circuits must have the insulation tested after installation and before any splices or terminations are made to equipment. All conductors must test free from short circuits and grounds, and a minimum insulation resistance phase-to-phase and phase-to-ground must be 30 megaohms measured with a 500 volt insulation resistance tester. Motors and transformers must be tested for grounds or short circuits before installation. Prior to final inspection, the Contractor must submit a test report including the circuit being tested, the test results, the person performing the test, and the date of the test.
- 2.2.1 Existing and Government Furnished Conductors - Government Furnished conductors must be tested prior to installation. Any conductor found to be defective after placement must be replaced at no additional expense to the Government.

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

- 2.2.2 Failure of Cable Under Test - Cable, including splices, which fail test requirements must be repaired or replaced, and retested. Cable must not be put into service until it has passed all test requirements.
- 2.3 Continuity Tests - All control cables, including individual conductors of a multi-conductor cable, must be continuity tested prior to connection. Prior to final inspection, the Contractor must submit a test report including the cable being tested, the test results, the person performing the test, and the date of the test.
- 2.4 Neutral Isolation Test - After installation of all branch circuits the neutral in the service entrance switch must be tested for isolation from ground with an ohmmeter set on its RX1 scale. Any contact between the neutral and ground (other than at the service entrance switch) is a possible cause of noise in electronic equipment and must be corrected.
- 2.5 Earth Resistance Test - Using the fall of potential method, the Contractor must measure the resistance to earth of each individual ground rod prior to interconnection with the 4/0 loop conductor. The results of these tests must be submitted to the site representative for review. After approval by the site representative, the ground rods must be interconnected and the resistance to earth of the new ground system must be tested with the results submitted immediately to the COTR for approval. The FAA requires a earth resistance of 10 ohms or less. Tests must not be conducted within 48 hours of a rainfall or in frozen soil. Prior to final inspection, the Contractor must submit a test report including the previous 72-hour weather conditions, circuit being tested, the test results, the person performing the test, and the date of the test.
- 2.6 Operating Test - After the wiring system installation is completed the Contractor must conduct an operating test for approval. The equipment must be demonstrated to operate in accordance with the requirements of this specification, equipment manufacture's specifications, and the contract drawings.
- 2.7 Shield Test - Continuity of shielding must be verified using a loop resistance test. An ungrounded shield to ground resistance test will be done to verify that the

SEATTLE TACOMA INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C/16L
LOCALIZER RELOCATIONS
AND
BELLINGHAM INTERNATIONAL AIRPORT RUNWAY 16 LOCALIZER
RELOCATION
AND
SEATTLE INTERNATIONAL AIRPORT (SEA) RUNWAYS 16C ALSF

shield is not grounded except at one end. Readings must be recorded and given, in writing, to the Site Representative.

3.0 **QUALITY ASSURANCE**

3.1 Submittals required include, but are not necessarily limited to, the following:

- Earth Electrode Resistance Tests
- Power Cable Insulation Resistance Tests
- Neutral Isolation Tests
- Control Cable Insulation Tests
- Operating Tests
- Shield Tests

* * * END OF SECTION * * *